

Bob Cooper's

DECEMBER 15 2004

SatFACTS

MONTHLY



Reporting on "The World" of satellite television in the Pacific and Asia

IN THIS ISSUE

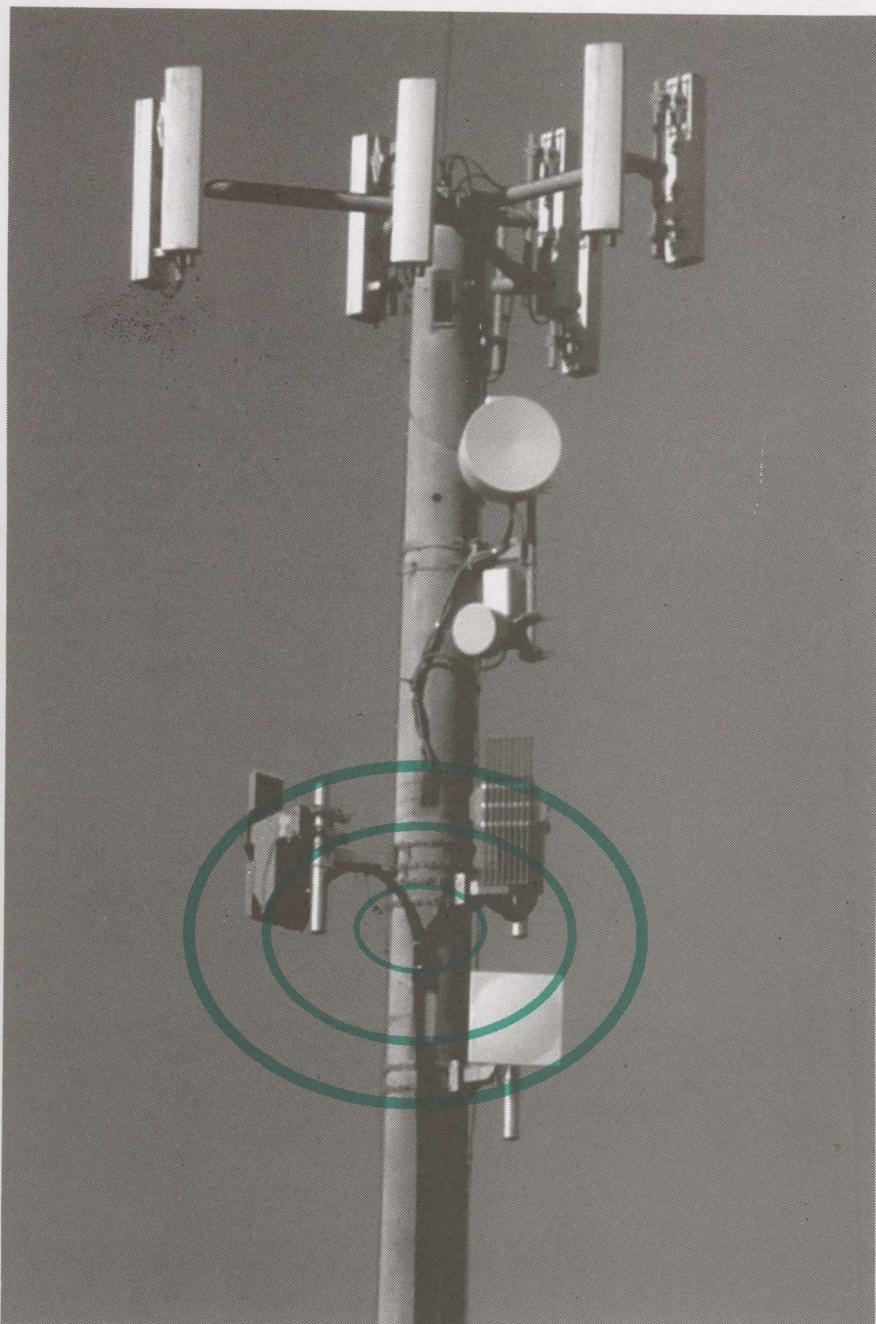
**Step-by-step:
curing 3.5 GHz
UNwired TI**

**Using a meter
to trace UNwired
points of origin**

**Judging
feeds by their
performance**

✓ Latest Programmer
News
✓ Latest Hardware News
✓ Update: Fiji on-the-air!
✓ Observer Reports

Vol. 10 ◆ No. 124
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Specials this month

Magix 9800 - Digital Receiver



- New Generation DiSEqC 1.3
- Universal LNB using DiSEqC
- Smart Code System (Soft Patch)
- User Friendly

Price: \$190 AUD + GST

Satlook - Signal Meter



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- A must for the professional
- Simple menus and functions

Price: Phone up for Quote

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- DiSEqC 1.2
- User Friendly

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- Zinwell KU Band
- MTI C Band, Superhigh gain
- One Cable Solution - CBand
- Dual Output KU 11300 MHz

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- Superjack DP-6600, DiSEqC 1.0/1.2
- Technosat DP-200, DiSEqC 1.2
- Manual Actuator Drive - EW101
- SAP 2000: 99 Memory positioner

Actuators

- Superjack HARL-3618, 18" Actuator
- Superjack HARL-3624, 24" Actuator
- Superjack DG-120, H/H Mount

Receivers

- SuperNET CA, Irdeto Embedded
- Success, Free-to-Air
- Dion DT-370, Free-to-Air Receiver
- Dion 2x CI, Hardware AllCAMed
- ChangHong, Mediaguard embedded
- SuperNET Terrestrial, DVB-T
- Phoenix High Definition STB

Dish and mounts

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- **2.13m, 2.27m, 2.4m, 3.0m, 3.07m, 3.7m, Mesh Dish, Light and Heavy Duty PSI and JOYSAT Available**

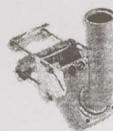
- CBand Wall brackets
- CBand Concrete mounts and stands
- KU Gutter mounts
- KU Wall mounts
- KU Float mounts
- KU Tinroof mount

Dion 818 CI - Digital Satellite Receiver



- Slim Size and User Friendly OSD
- 2x CI (Common Interface) slots
- Hardware AllCAMed

SuperJack H-H Actuator, DiSEqC embedded



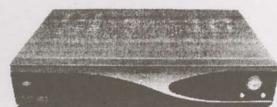
- All it takes is one coaxial cable....
- NO MOTOR CABLE REQUIRED
- DiSEqC Positioner EMBEDDED!

Supernet - Terrestrial DVB-T



- Digital Terrestrial Receiver
- Slim Design
- High Quality Picture
- Easy to install and use

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- FTA + Software Patched
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Switches and Splitters

- 2 and 4 way DiSEqC switches
- 0/22kHz switchs
- 2 and 4 way cable splitters
- V/H Multiswitch
- 0/12V Switch

Cable - 15m, 25m, 305m packs

- RG6-U Dual Shield Coaxial Cable
- RG6-U Quad Shield Coaxial Cable
- Cat5 Actuator Cable

Plugs

- F Connectors, Screw or Clamp types
- Cable joiners
- AV Splitters
- Cable Strippers
- Cable clamps
- Various other joiners and accessories e.g. RCA/SCART cables and converters

Misc

- 2.4GHz AV Sender
- Irdeto 2.06B CAMs
- Satlook Digital Signal Meter
- Satlook Analogue Signal Meter
- Satlook Digital + Analogue combo
- Satellite finders
- Angle level measure instrument
- High Quality Compasses



SatFACTS MONTHLY

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This publication is dedicated to the premise that as we enter the 21st century, ancient 20th century notions concerning borders and boundaries no longer define a person's horizon. In the air, all around you, are microwave signals carrying messages of entertainment, information and education. These messages are available to anyone willing to install appropriate receiving equipment and, where applicable, pay a monthly or annual fee to receive the content of these messages in the privacy of their own home. Welcome to the 21st century - a world without borders, a world without boundaries.

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The fine print

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our ELEVENTH year!

COOP'S COMMENT

Nothing drives "grey market" sale of programming cards as strongly as ethnic programming. Not sports, not movies. And the world is constantly in a state of population shift - émigrés from dozens of countries arrive in Australia, New Zealand monthly leaving behind older cultures, hoping to find new family stability in a foreign land.

The turn-on of Fiji TV on

December 15th will herald the latest rush to re-establish "cultural ties" with a homeland. For all of the many reasons regular readers of SatFACTS understand, Fiji's Sky Pacific satellite service is totally unique in the world; a high power C-band "spot beam" which in fact, unlike Ku band "spot beams," is not so much spot as "splotch." Translation? The coverage region is broad and wide rather than tight and concise. Ku band spot beams, such as the C1 coverage of Australia, can be "sculptured" by clever transmit satellite antenna designers, to mimic the actual geographic outlines of a country. And with each generation of new satellites, these antenna designers get better at what they do. Future Ka band (18 GHz) satellites, now just coming on line, will be even more amazing, capable of "mimicking" the city of Sydney's geographic coverage area almost as precisely as the actual city itself.

But C-band, being 4 GHz rather than 12 (Ku) or 18 (Ka) is much tougher to control and when Intelsat I701 was designed, the builders could at best guess what geographic area a C-band spot beam might actually require (when I701 was designed they had no customer for a C-band spot beam, and included this "splotch" beam capability on board primarily to cover their hind ends - just in case one might develop). So after nearly six months of hassles, here we find Fiji TV on a very unique (there are no other similar beams from any satellite in the world on C-band) coverage pattern which delivers useful (3m and smaller) signals over an area measuring roughly 3,000 miles/4,800 kilometres north by south and an equal "width" east by west.

Fijians have for decades immigrated in sizeable numbers to New Zealand (primarily Auckland) and Australia (Sydney, Brisbane and Melbourne) and Fijian sources suggest as many as 300,000 Fijian natives now live "out of country." If Fiji TV is suddenly available to dishes in the 1.5m region (much of NZ) or 2.4m region (much of eastern Australia), does this not suggest an opportunity for the sale of satellite receiving systems to perhaps 50,000-plus new customers in these two countries? Does it also suggest new "grey market" challenges for those who provide smart cards?

Yes, and, no. First of all, within the 12 programme channel bouquet for Sky Pacific, one channel is FTA; the terrestrial "Fiji One" service. The remaining 11 channels are Nagravision 2 encrypted and nine of these 11 are duplicates of what is already available in NZ and Australia (CNN, Discovery, Cartoons etc.) The "other two" will be Indian sourced Hindi based - similar to the 4 channel SET Mux bouquet already available on B3. So what is the real "lure" here? Fiji One, FTA, which requires no card of any kind; simply a suitable dish, LNB(f) and (FTA) receiver. And it will be Fiji One, with Fiji produced "local" shows, that attracts out-of-country Fijians - not already available repeats of Discovery or E!.

We've never had exactly this situation previously so it would be foolish to suggest how it will turn out. Stay tuned!

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-On the cover-

UNwired. Typically shares towers with various cell-fone providers. The antenna enclosures (lower on tower) are usually physically "smaller" than anything else on tower site - because the 3.5 GHz antenna arrays are the "highest frequency/shortest wavelengths" at each location. (Photo courtesy Garry Cratt) -p. 6



December 15, 2004



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Scratchi - October

"After reading the Scratchi page (SF#122) reporting on the status of C-band interference and the position of the Australian government, I would very much like to donate some moneys to fund a legal action. Please let me know where to send the cash! In my opinion, it seems every dirty trick imaginable is being used to destroy the C-band market world in Australia. First, the stupidity of the local councils when they decided to classify a TVRO satellite dish as a 'Telecommunications Facility' which effectively denied Australian citizens access to the free flow of information. It is a pity the Australia does not view the importance of this freedom in the same way that European countries do; there, this freedom is fiercely protected. Imagine how long this illegal use of C-band frequencies would exist if it had been Ku-band and it was Foxtel and Austar homes on the end of interference!"

CP, Victoria

Foxtel's 3 input limit

"Very few people realise how deep the subterfuge runs at Foxtel (and Austar to a lesser extent) to ensure that they are the only satellite pay-TV providers in this country. Example? First of all, Foxtel has a totally ridiculous set of 'technical standards' for every item between the dish and the receiver. Foxtel will not approve - which means the installer cannot use - any multi-switch which has 4 or more inputs. Harmless enough? Not quite. By limiting the number of multi-switch ports to 1, 2 or 3, Foxtel effectively ensures nobody will ever be able to create a new pay-TV network via satellite in competition to them. Anyway you spell 'Foxtel' it comes out 'monopoly'!"

IA, NSW

One part at a time.

Training?

"Is SatFACTS or SPACE still conducting correspondence courses for the satellite digital installer?"

Raj Suren, Navua, Fiji Islands
Regrettably, not at the present time.

PROGRAMMER PROGRAMMING PROMOTION

UPDATE

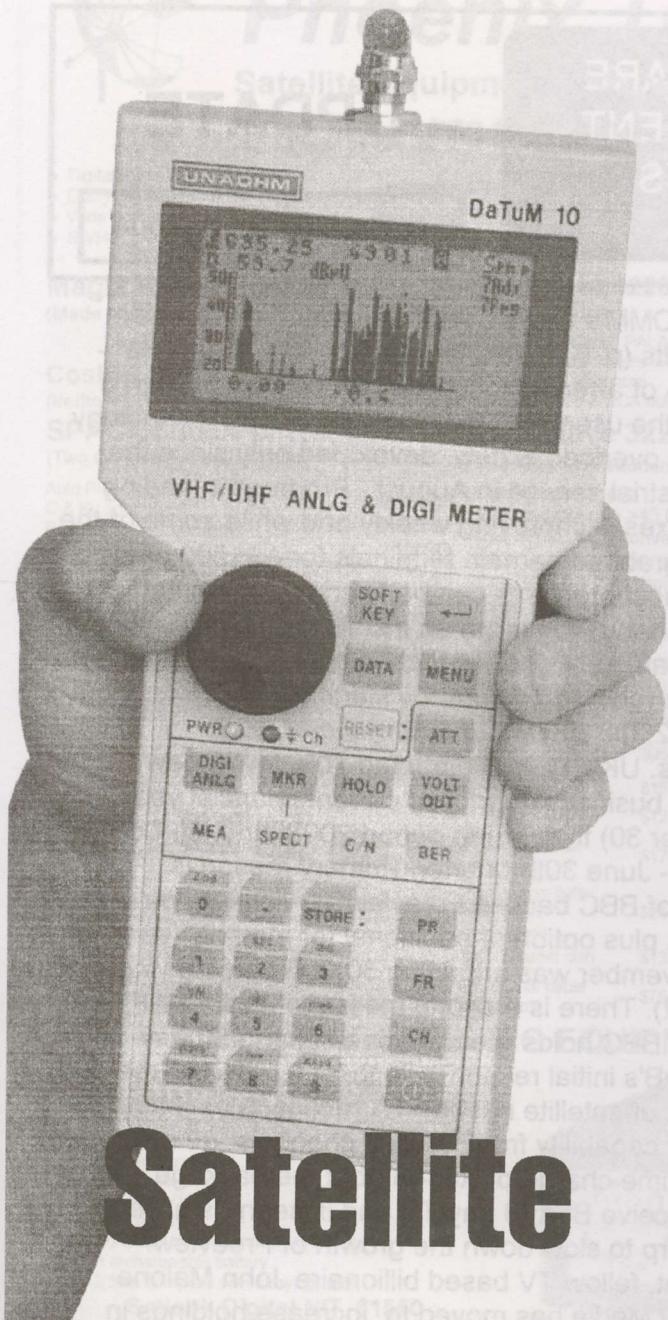
DECEMBER 15, 2004

Microsoft. Have they given up on TV? Not quite, not yet. Although the firm has invested billions of US\$ into broadcast (MSNBC) and cable system operations, so far it has failed to capture the one goal it most covets; being the source for software behind every TV screen. The latest effort: Windows XP Media Center, introduced in mid October, expands PC functions to include (1) photo album, (2) juke box, (3) DVD player and now - (4) a TV set with a built-in (hard drive) recorder. HP, others, plan January release of newest software which will allow transmission of any-of-the-above to a television set in another room, using a (2.4GHz) wireless network. Microsoft introduced their first Media Center in 2002; a failure to date (3% of systems sold) but the new version promises to find a home on low-end US\$ computers - below the \$1,000 price tag level. It is difficult to see where Microsoft is going with this - if hard drive recording and retrieval is the anticipated "killer application," competitor TiVo goes out at a retail cost of around US\$100 (with rebates).

TVNZ's still secret plan to create a free-to-air MUX using B1 transponder space (now; in 2006 an expanded MUX using yet to be built or launched D1) has found its way into some press circles. It appears the plan has received (TVNZ) Board approval, under the direction of William Earl, and TVNZ has trademark-reserved a number of descriptive names of which one may ultimately be the "branding": FREEVIEWTV, FREESATTV, FREESAT, FREEVIEW. Rumours, all unconfirmed, suggest TV3 and Prime TV will become part of an expanded TVNZ FTA MUX as soon as April 2005. Here's an option TVNZ possibly has not considered: The new I701 C-band spot beam for Fiji TV would be an excellent platform to allow New Zealand to export meaningful service to virtually the entire mid-Pacific region, thereby "coasting" on the terminals Fiji viewers will be putting in anyhow (see p. 29, here).

Fiji's C-band launch is scheduled as we go to press for December 15th (see p. 20, here). A 6 GHz (up; 4 GHz down) "fly-away" terminal arrived in Suva December 7th, will be used for 3 to 4 months while original Fiji TV Ku band uplink is rebuilt (at NSS expense) for C-band. A new element has been added to the general confusion level in Fiji: Australian based *Tv2/Maire Limited* has announced a competitive (to Fiji TV) FTA TV channel which it claims would be "100% Fiji owned" although managed from Australia. A press release includes the statement, "The new station would cover all of Fiji as *Tv2* had an agreement in principle with *New Skies* to distribute the station's signal via satellite to its transmitter network across Fiji." *New Skies*? Unlikely, as NSS-5 was removed as a possible satellite provider to Fiji back in June - as most of us already know. This announcement suggests more fluff than substance as *Tv2* will require Fiji government licensing and to date other applicants for similar licensing have been ignored.

It's all in hand.



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Best system in South India?

I live in Chennai (south of India) and plan a dish installation for my home. Should I get a 1m motorised dish for both C and Ku band, a dual band LNBf, and a blind search receiver? Where can I procure what I need?"

Ram as gееаar71@yahoo.com

The smallest C-band dish to consider is 1.2m and then only if you are within 37/38 dBw footprints of your target satellite. Hardware? India is a large country and perhaps you would do best locally. But if you are set upon getting the best package, try info@jsat.tv (in Thailand).

90% for fibre?

"SatFACTS comment (SF#122) that 90% of the traffic into and out of New Zealand is using fibre - I do not think anyone very close to the business would make that comment. I am not even sure how one would calculate that. Even after TVNZ shuts down the Satellite Services division, TVNZ will still maintain two uplinks from Auckland (circular C-band and linear Ku)."

name withheld, Auckland

UNwired reaction

"I am pleased to see the intensive coverage of the UNwired interference issue and applaud Garry Craftt for not only creating a series for SatFACTS but for Australian electronics magazine *Silicon Chip* as well. What concerns me, however, is a report supposedly made by an Australian government official to the effect, 'Too bad (about the interference) but you are not supposed to be watching overseas satellite programmes anyway...' I suppose by extension it would also be inappropriate to be listening to shortwave broadcasts from overseas. When did Australia close its' borders to foreign media?"

LW, Queensland

Not closed but folks such as UBI, Foxtel et al would like it to be shut down. Big companies with big dollars to spend promise jobs, support for political causes, and a more 'regulated' lifestyle. What they cannot get directly they target indirectly - such as authorising UNwired which in the process 'just happens' to be an interference source to foreign reception.

S 20 shortfall?

"One obvious limitation: Symbol rate max is 36 MS/s which if Fiji TV does use their original 43.600 would rule it out for their installers."

IF, Queensland

Fiji's Sr is unlikely to exceed 36 MS/s.

HARDWARE EQUIPMENT PARTS

UPDATE

DECEMBER 15, 2004

UNwired? AV-COMM's Garry Craftt has tackled the problem with excellent results (p. 6, here). This one is 90% "beatable" - meaning not 100% of affected locations can be cured within a price range which the users will find acceptable. The technology for curing UNwired overload is new, developed only since the launch of the terrestrial service in August. Progress in finding suitable low-cost fixes is improving weekly and while some of the ethnic-users who grabbed bargain terminals for A\$1500 or less might not agree, most problems can be fixed at a reasonable cost. On the other hand, if you are an installer for low-price-end systems and are baffled by the "fix-technology," you can upgrade your skills (and equipment) by starting with a Spectrum Analyser tool (p. 12, here)! *Or find a new line of work.*

Murdoch's woes. UK's BSkyB attracted 70% fewer new subscribers in first business quarter of current financial year (July 1 - September 30) than same period 2003, and, 31,000 fewer than April 1 - June 30th quarter. Primary reason is runaway success of BBC backed Freeview service that provides 30+ channels FTA plus option of additional for monthly fees, which through November was attracting 50,000 new viewing homes per week (!). There is a strong message here - 30 FTA channels from the BBC holds greater appeal than 400 pay-TV from BSkyB. BSkyB's initial response to the success of Freeview includes new offer of satellite based FTA reception package claiming reception capability from 140 TV channels, 80 radio channels for one time charge of A\$345 - but the package cannot be upgraded to receive BSkyB pay-TV and is seen as a weak effort by News Corp to slow down the growth of Freeview. Closer to his wallet, fellow TV based billionaire John Malone through his Liberty Media has moved to increase holdings in News Corp from 9 to 17% - one percent shy of being in a position to dictate who might inherent Rupert's control of News. The vultures are circling 73 year old Murdoch and his body is still warm.

ABC A-P on PAS-2? We reported (SF#121) ABC advisory they planned to cease PAS-2 transmissions (3901H) "shortly after first of year (2005)" but there is contrary information. ABC email to American Samoa's Bill Hyman includes line, "We have no intention of ceasing our transmissions through PAS-2; there will be changes to our transmission but probably not until March/April (2005) and this should not affect PAS-2 coverage." Western Samoa, American Samoa, Tonga and others depend upon PAS-2 coverage as the PAS-8 service is significantly degraded "east" of the International dateline. There was some logic to support shutting down PAS-2 at one point - when Fiji TV (which includes ABC A-P in its bouquet) was likely to start NSS-5 Ku transmissions by October. Alas - that was not to be.

Apsattv site; if not working for you, try <http://202.9.227.18/~csutton/>. Site has experience problems during November.



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- Digital Audio Output (S/PDIF)
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(Made in Korea)



\$220

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- Electronic Program Guide
- Channel Rename Function
- Software Upgradeable

\$180/each (for 6 unit)
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Coship digital receiver
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NextWave 3220 FTA digital receiver
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C & Ku band input, PAL/NTSC auto converter
5000 channels Picture in picture EPG
DiSEqC1.0/1.2 control
TV/VCR Scart & RCA outputs

\$160

Optus C1 Aurora Kit
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(Irredto cam embedded)
11.3 GHz/Universal Ku
LNB, 75cm dish, Mount
bracket

\$315/set

+Aurora card \$75

SPACE 5300A CI Receiver
(Two Common Interface Slots)

Auto PID correction
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PAL/NTSC auto converter
5000 channels
Picture in picture EPG
DiSEqC1.0/1.2 control
TV/VCR Scart & RCA output

\$180

NextWave 3220C digital receiver
(Two common interface slots) (Made in Korea)

C & Ku band input
High symbol rate >45,000
PAL/NTSC auto converter
5000 channels Picture in picture EPG
DiSEqC1.0/1.2 control
TV/VCR Scart & RCA outputs

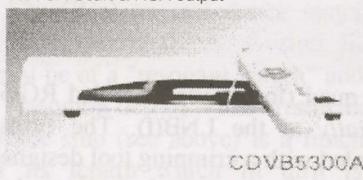
\$220

LBC, ART, AI Jazeera Kit
Coship digital receiver

(Irredto cam embedded)
C-band LNB, 2.3m
+Subscription fee
Mesh dish.

\$435/set

\$20/month*



CDVB5300A

SPACE 2300 digital receiver

Auto PID correction
C & Ku band input
PAL/NTSC auto converter
5000 channels
Picture in picture EPG
DiSEqC1.0/1.2 control
TV/VCR Scart & RCA output

\$140

Irredto 2.06B CAM \$140
Viaccess CAM \$140
65cm offset dish \$27
75cm offset dish \$40
Superjack DiSEqC 1.2 motor \$95
Universal Mount \$15
2.1m mesh dish \$120
2.3m mesh dish (motorized) \$170
2.4m heavy duty mesh dish (motorized) \$210
1.8m 6 panel dish \$130
RG 6 Dual cable (305m/roll) \$75
Zinwell C band LNB \$35
Zinwell 10.70/11.3 /Universal Ku band LNB \$25
MTI C band LNB \$35
One cable solution C-banc LNB \$50
Satellite finder \$30
Silver Card (10/bag) \$125
Gold Card (10/bag) \$85
RG6 Stripper \$20
RG6/11 Crimper \$30
Angle meter (made in USA) \$85
Compass \$30

Start from
\$250/set

Free to air kit (for NSS 6, Optus B3)

Including dish, LNB, digital receiver, etc.



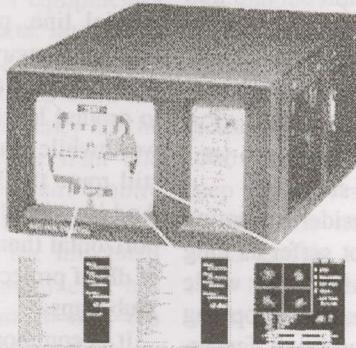
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Satlook MARK III \$950

- 4,5" B/W monitor for PAL/NTSC/SECAM
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- Tunable sound 5,5-8,5 MHz
- Spectrum analyzer
- Expanded spectrum
- LNB voltage 13/18 V
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- Built in rechargeable battery
- Only 3,5 kg complete with carrying-case

Satlook Digital NIT \$1550

We are pleased to introduce our new SATLOOK Digital NIT. NIT stands for NETWORK INFORMATION TABLE, which today almost all DVB-satellites transmit as standard. The NIT contains information about the Satellite and TV/Radio-channels. It's very easy to identify a Satellite when reading out this information. The different TV/Radio-channels on a transponder can also be read-out.



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- Input frequency: 2-900 MHz and 920-2150 MHz
- 4,5" B/W Monitor for PAL/NTSC/SECAM
- Lots of memory positions for spectrum pictures
- RS232 for PC-connection
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- TV-PART**
 - 2-900 MHz spectrum analyzer
 - Presents full range spectrum (and expanded)
 - Very high accuracy, ±1dB (at 20 C)
- SAT-part**
 - 920-2150MHz spectrum analyzer. Digital BER, QPSK and S/N-ratio
 - Satellite-ID and TV/Radio-channel info (NIT)
 - Tunable audio bandwidth 5.5-8.5MHz
 - LNB voltage 13/18V, 22kHz tone switch
 - DiSEqC according to level 1.0, 1.1, 1.2
 - KU- and C-band (normal/inverted video)

Full range of C/Ku band satellite dish - panel & mesh, prime & offset, from 45cm to 4.5m

Full range of Zinwell, MTI C/Ku LNB - Dual output, one cable solution, C/Ku combination

Full range of actuator - From 12" light to 36" heavy duty

DiSEqC 1.2 Positioner & SupperJack EZ2000 Positioner

2.4 GHz AV sender and Remote extender

RG6 Cable and Motor cable

Full range of satellite accessories



THIS MONTH SPECIAL



SPACE 2300A FTA Digital Receiver \$1300/(10 units)
Magix 8800 Digital Receiver \$1200/(6 units)

Phoenix 2.3m Mesh dish \$1650/(pallet of 10 sets)
Zinwell LNB 15K C-band LNB \$648/(box of 24 units)

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Garry Cratt's Part two: UNdoing the UNwired mess

When interference is suspected, try the easiest solutions first. Remember - this is an imperfect science and the cost of the cure is directly related to the intensity of the terrestrial interference. However, these are also early days and each successful fix will contribute to our overall body of knowledge. It *will* get easier - with time.

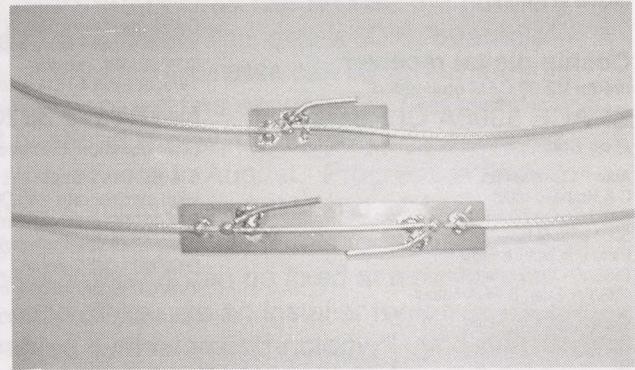
Existing systems - still functional some channels

The lower the level of interference, the less complex (and costly) the solution. But even the "simple" cases require some special skills which you can only learn with hands-on experience.

The basics. With UNwired blasting away on and between 3.425 and 3.575 GHz, the first obvious fact should be that any satellite signals between 3.4 and perhaps 3.65 GHz will be gone (that can include transponders from Telstar 10, Thaicom 3, InSat 3A, InSat 2E, AsiaSat 3S and Palapa C2M). The UNwired signals are as much as 70 dB stronger than the pico-powered incoming satellite signals. How much is 70 dB? Lets start with a 10 microvolt signal - far too small to work with any known TV system including FM satellite - and go up 70 dB from that. The new number (after adding 70 dB) is 3.2 volts. If 10 microvolts is 1 mile per hour in a vehicle, 70 more dB is the same as 3,200 miles per hour. That should give you a signpost relating to how much 70 dB really is! (You might walk alongside a vehicle at 1 mph but at 3,200 mph ...)

For existing sources, first try to identify the possible source. It will most likely be a nearby mobile phone tower, high-rise building rooftop, or communications site. Use the ACA website (www.aca.gov.au) to identify the sites nearest to your troubled location (the website lists all licensed sites).

If the satellite dish is rooftop mounted, consider relocating it to ground level (the satellite signals will not suffer as long as LOS - line of sight - to the bird is maintained while terrestrial interference will decrease significantly). Dropping it to the ground allows you to use nearby buildings, fences, heavy vegetation as a shield or "wall" to block the TI (terrestrial interference). The logic here is straight forward - insert a building/wall/fence/vegetation between you and the source (which you have identified from the ACA website) and tens of dBs of TI signal will evaporate.



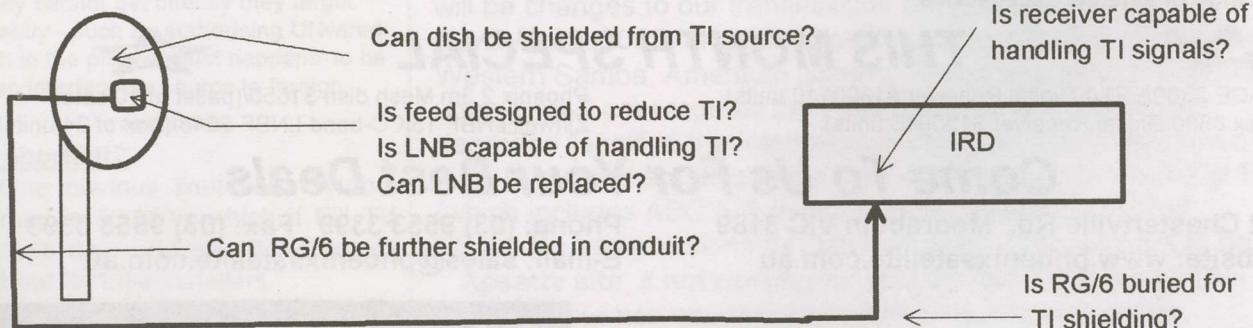
Inspect the cable. Is it quad (four layer) shielded RG/6? Check the fittings, *especially* at the LNB(f). The fitting should be "compression" sealed with a crimping tool designed for the fitting. A "star/hex" crimp, which only makes electrical contact between the fitting's shield and the cable's shield at 4 or 5 or 6 points is not acceptable. If you retain a roof mount, some amount of cable is run "vertically" (up to down) as it goes into the building. The portion that is *vertical* is capturing the vertically polarised UNwired signal, which penetrates the cable shield (even quad shield) allowing TI energy to get inside to the centre conductor. Which is precisely where you do not want it! One fix is to reinstall the coaxial line, placing it inside of metal conduit which will become a *new* "shield" that is significantly more effective than the quad (or duo) shield cable. If, after moving the dish to ground level, you still have some interference, it would be worthwhile (but no guarantees it will cure the problem) to still route the RG/6 from the dish to ground level in conduit. And if some of the cable just lays *on* the ground, even if more horizontal than vertical? Bury it - even 30mm will create tens of dB of protection for the cable's direct pickup of UNwired.

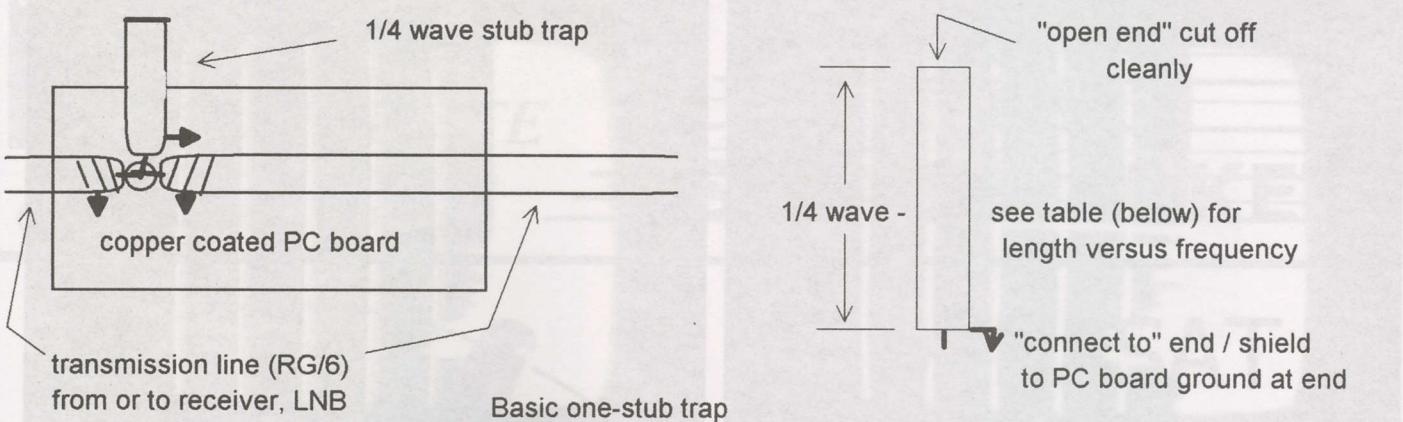
Stub traps

It is common knowledge in communications work that you can "trap" (shunt to ground) a particular frequency (or frequencies) by creating a "stub filter/trap." It works this way.

All signals have a definite frequency and all frequencies are akin to that dreaded enemy - lightning. They want to find the "best impedance match (to ground)." A stub filter is just that

Pressure points for UNwired TI





- placed in the transmission line it offers the signal on a particular frequency (such as the UNwired 3.575 GHz) an impedance matched pathway to oblivion. A stub filter must be of a "resonant length" and of a "resonant design." The "resonance" of the stub (see above) is a function of its length which in turn is a function of the frequency and (a big *and!*) the characteristics of the stub "line." By placing the stub "across" the incoming LNB(f) RG/6 coaxial cable, you basically "suck" the energy from the line that is on the frequency which the stub mimics. That says a length of line of the proper dimensions can be a "signal sponge" eliminating that one particular frequency from the RG/6. A warning. This is not a cut and try exercise (unless you have totally unlimited time and the patience of a saint). It requires appropriate test equipment - preferably a 900-2150 MHz signal generator, and, *absolutely essential* - a spectrum analyser covering the same frequency range. What you will be doing, as you design and build the stub trap(s), is making it resonant on the frequency of the interfering signal(s) ("s" - there may be more than one causing you grief at any given location and *each* may require its own stub trap). The stub trap goes into the line between the LNB(f) and the receiver - to "suck out" the unwanted carrier before it overloads your receiver (this assumes it has not already overloaded the LNB[f] and sent it into the undesired cross modulation state). Alignment is done by taking a pre-determined length of "unterminated" 75 ohm cable and checking it (with the signal generator and spectrum analyser) to determine where the L band "suck out" (signal

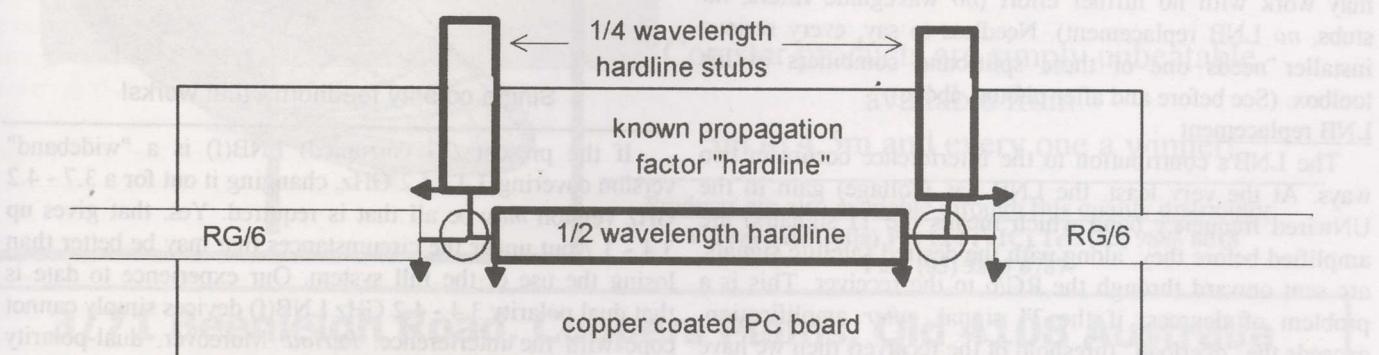
attenuation) occurs. Examples are shown here.

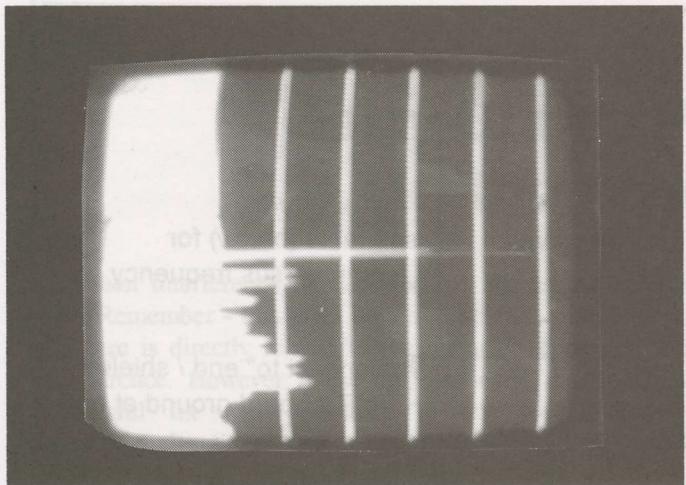
The selection of 75 ohm cable is critical (RG/6 is not a suitable choice); the best is a 50/75 ohm miniature silver plated hardline. The source for such a product? Believe it or not, at "ham radio" and other "surplus/boot sales" when VHF-UHF

"signal generators" are being sold as "scrap." Inside these antique boat anchors, one often finds a half metre or more of the prescribed hardline. As the table here shows, you require from 27 to 60mm of the line to create either a 1/4th wave stub or a pair of stubs separated by a 1/2 wave (length) of the same line. Selection of a suitable line for the stub filter also involves knowing the "velocity factor" of the cable chosen as there is a relationship between the actual length of the filter (see diagram, above) and the velocity factor. Repeating - you cannot do this with a chunk of RG/6. *Period.*

What we have found is that 30mm of this material, as a quarter wave stub, will create around 70 dB of rejection at 1500 MHz. For each 1mm the cable is shortened, the 70 dB deep trap moves in frequency by approximately 90 MHz (i.e., as the table here shows, 30mm length equals 1500 MHz which equals 3.650GHz while 29mm shorted length equals 1590 MHz [L-band] equals 3.560GHz and so on). There are other hints: Do not include the amount of cable "stripped" (shield portion moved) in the calculation of length - the effective length is the total of the hardline shield portion only.

As most installations require that IRDs send power to the LNB(f), the stub traps must be power passing as well. This





Interfering (UNwired) signal is lots-of-dBs stronger than desired pico-watt level satellite signals (TI at top).

means there must be no residue (thin pieces of shield) that improperly touch the centre conductor line.

The frequency response of such filters is not uniform - rather, they are "lopsided" and typically achieve approximately 10 dB of rejection per 10 MHz. Translation? The "stop band" bandwidth of the stub is quite broad. But having given these warnings, the stub offers an attractive and low cost approach to ridding a system of UNwired energy *after* the LNB(f).

One simple test

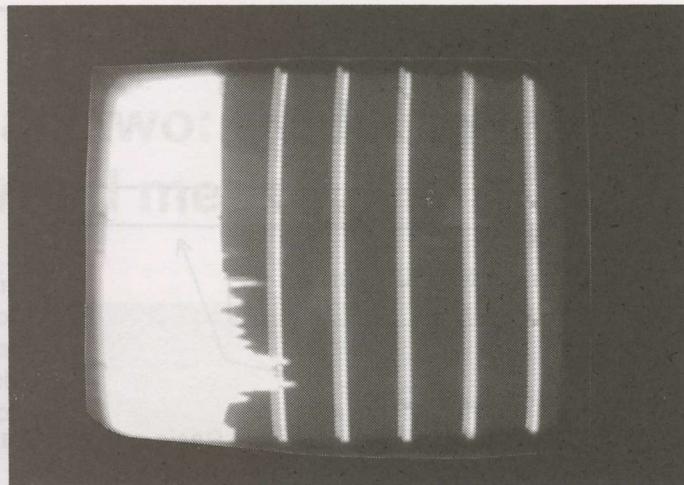
If making stub traps is not your cup of tea, here is one quick and easy test you can perform. Take a 10 dB (**power passing - this is important!**) attenuator and place it in line with the RG/6 at the input to the receiver. If the UNwired signal is reduced 10 dB, and, your satellite input level will stand the same 10 dB of reduction as well, we have found that *some* IRDs will perform once again because they are no longer overloaded by the strong "out of band" signal(s). In less than a minute you know the answer so it is worth a try.

Another simple test

A number of firms offer a dual-band combiner - one output port and two inputs designed such that 950-1450 feeds one (in) port and 1500-2000 or 1650/2150 feeds the other. Inside this combiner is a set of frequency filters. If you connect your LNB(f) to the 950-1450 port and the IRD to the output port, the circuits inside the combiner will significantly attenuate signals that fall outside of the 1450 L-band region - such as UNwired at 1500 to 1770 MHz. In each particular case, this may work with no further effort (*no* waveguide filters, *no* stubs, *no* LNB replacement). Needless to say, every serious installer needs one of these split-band combiners in his toolbox. (See before and after photos, above)

LNB replacement

The LNB's contribution to the interference occurs in two ways. At the very least, the LNB has (voltage) gain in the UNwired frequency band which means the TI signal(s) are amplified before they, along with the desired satellite signals, are sent onward through the RG/6 to the receiver. This is a problem of degrees: if the TI signal, *after* amplification, exceeds the "overload" threshold of the receiver, then we have a receiver problem. But the "overload" level (tolerance) of the receiver is a mercurial thing - changing the direction of the satellite dish (pointing), from say As3S to Thaicom 3,



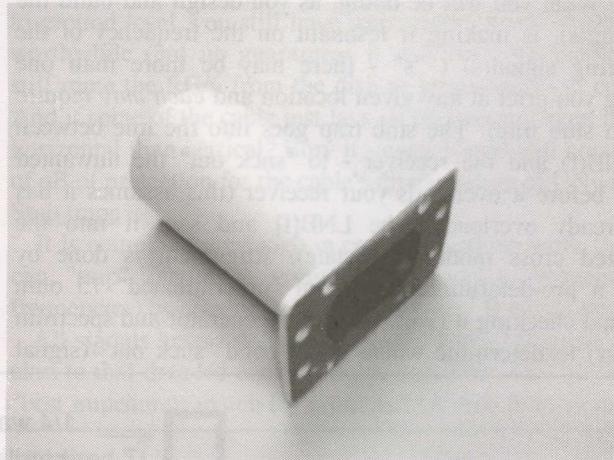
Interfering signal is essentially gone after installation of two-port combiner (see text) although signals nearest to TI (3700 MHz) are also reduced.

changes the amount of UNwired signal the antenna intercepts - one antenna heading may be "clean" while another may be "overloaded." This creates frustration because as the TI levels change the interference comes and goes on the system. The rule here is that if the LNB itself is being overloaded, you have three choices:

1/ Try a different make/model LNB hoping that a replacement will be less susceptible to the TI signals. Older MTI (Taiwan) brand LNBs, designed for high TI areas, are especially suitable.

2/ Install (as a second choice) a single polarity LNB and feedhorn (remember - UNwired is vertically polarised and the majority - not all - of its interference will arrive at your site vertical), and write-off vertical totally.

3/ Install (third choice) a waveguide filter (goes between the C band feed and LNB).



Single polarity feedhorn - that works!

If the present (TI corrupted) LNB(f) is a "wideband" version covering 3.4 - 4.2 GHz, changing it out for a 3.7 - 4.2 GHz version *may* be all that is required. Yes, that gives up 3.4 - 3.7 but under the circumstances that may be better than losing the use of the full system. Our experience to date is that dual polarity 3.4 - 4.2 GHz LNB(f) devices simply cannot cope with the interference. *Period.* Moreover, dual-polarity LNB(f) units covering even 3.7 - 4.2 (i.e. not 3.4 - 3.7) are also not capable of handling the TI. This could change with time when the LNB designers provide a product that includes

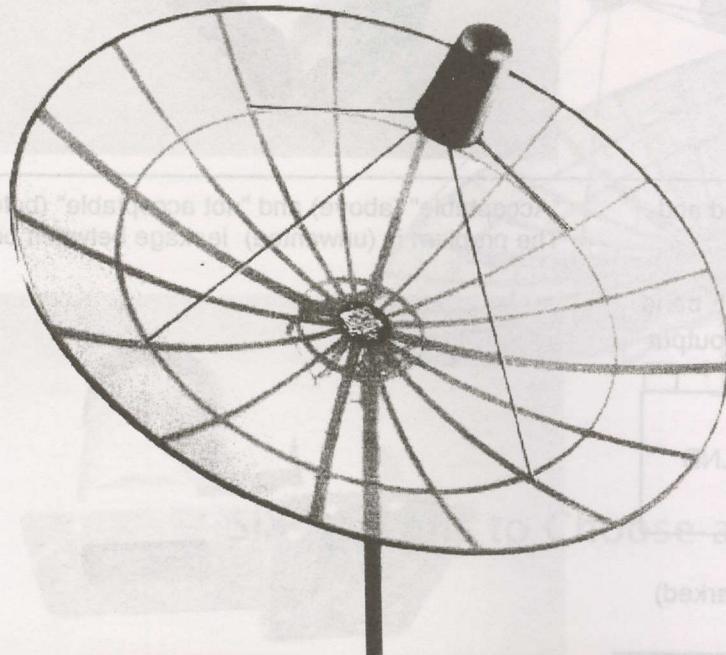


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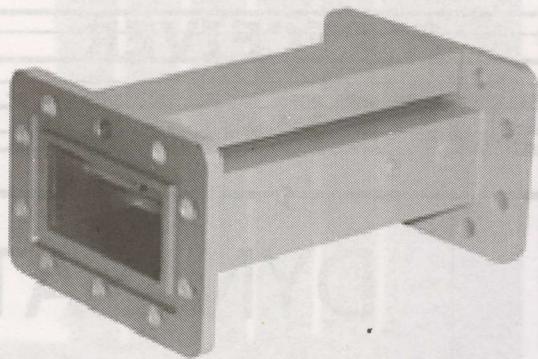
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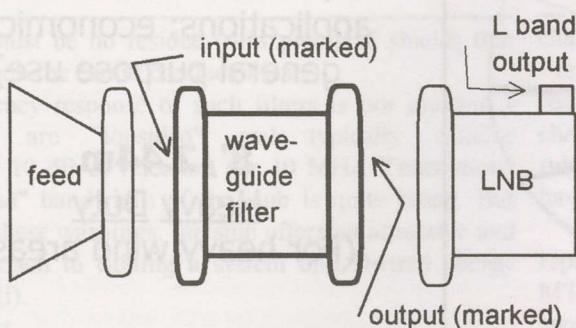
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Waveguide filter (MFC) installs between feed and LNB - "flange to flange."



inbuilt 3.4 - 3.7 GHz filtering but today there is no such product on the market (see SF#122, p. 2X).

Bottom line? Replacing a dual polarity (vertical and horizontal) LNB(f) with a single polarity model is a **huge** step in the right direction, as long as single pole reception is acceptable to the user. *And if not?* Even if the customer is willing to pay the cost of a waveguide filter, you may not be able to guarantee TI-free reception. Not all LNBs are created equal - there is a reason why some cost A\$20 and others A\$300! We'll see why.

And if it is the receiver and *not* the LNB that is being overloaded? The stub filters are one possible answer; replacing the IRD with one demonstrating greater resistance to overload is another option.

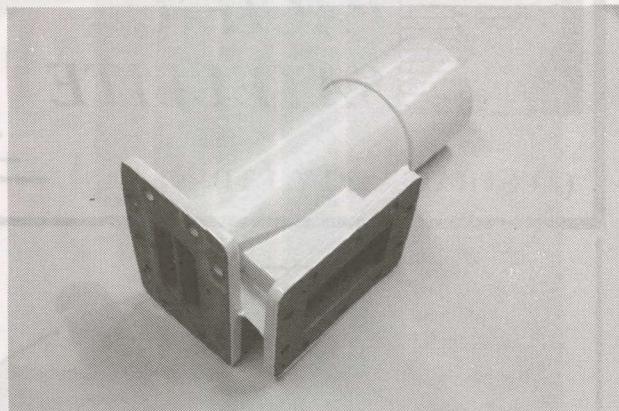
The waveguide filter

Waveguide filters (such as from MFC) are designed with different "loading" on the input and output ports (flanges). While they might *appear* identical cosmetically, and symmetrical, it is important to observe (and follow) the "port" (as in "Input" and "Output") markings. Using a waveguide filter in reverse (out as in, in as out) provides *very poor* filtering.

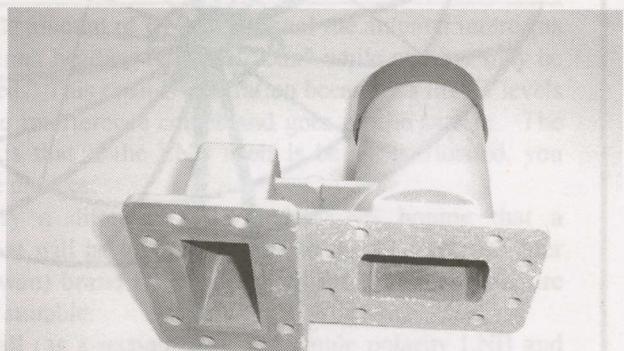
As a general rule, the grooved flange, designed to accept a gasket, must be mated with the feedhorn (i.e. "input"). Vendors warn that use of a sealant on the mating surfaces will "substantially reduce" the performance of the filter (the sealant or a lubricant such as Vaseline can allow TI signals to "leak through" the mating flanges).

Dual polarity orthomode couplers

Commercial installations requiring operation of both polarities will require two appropriate LNBs, two waveguide filters (one on each port) and an orthomode coupler. About



"Acceptable" (above) and "not acceptable" (below). The problem is (unwanted) leakage between ports.

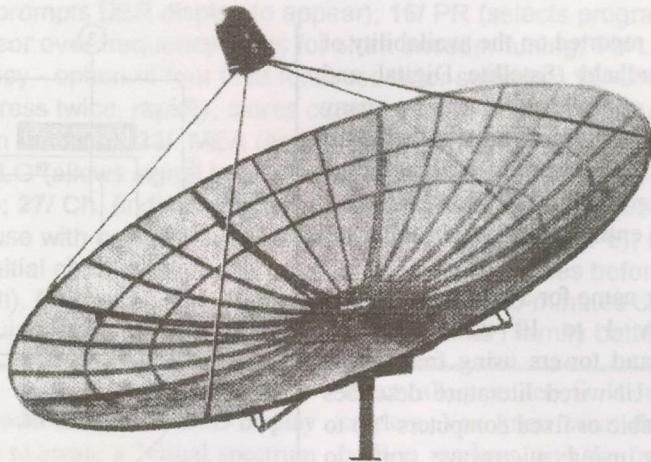


which; there is a world of difference between these dual polarity devices. The unit appearing here ("approved") has proven to be vastly superior to that shown separately ("not approved" - from the Chaparral design family). In some early orthomode commercial installations AV-COMM has encountered, when only one signal polarity was in use, only one port has the LNB fitted. This curious attempt at economy has the unfortunate side effect of creating a perfect "open end" conduit for the interfering signal to enter the orthomode coupler's unused port. If there is an unused port, it should never be left "open" - place a second LNB on the unused port as a way of closing up the gaping hole - even if the second is a "dummy!"

The future of TI

TI is here and blowing up UNwired transmitter sites is not an acceptable response (even if some chat rooms are suggesting this "solution"). This one can be cured, totally, in 90% of the cases and that percentage is likely to improve as we learn more about the offending service. But it requires a new level of skills, new investment and a willingness to accept that the first (and second) attempts may not work. Investment? Plan on spending \$25 for a 10 dB inline attenuator, \$99 for a PLL dual range combiner as a minimum. Yes - you do need a spectrum analyser. *Period.* For your clients, \$150 for a C band single polarity DRO LNB with built-in filter, \$550 for a C band PLL quality LNB, \$75 for a single pole feedhorn, \$125 for a C band orthomode coupler and where required - over (A)\$1,000 for a waveguide filter. The Australian C band world just changed - *big time!*

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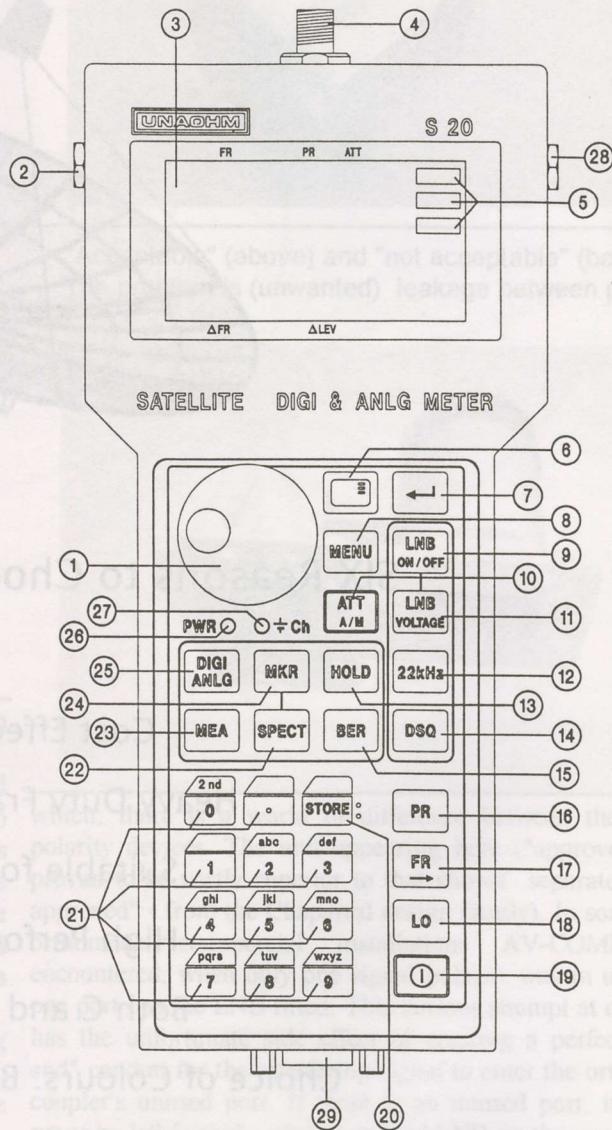
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S 20 has become an essential part of any competent installer's kit-bag

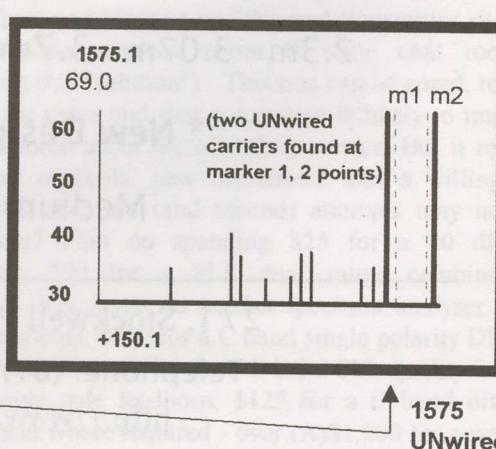
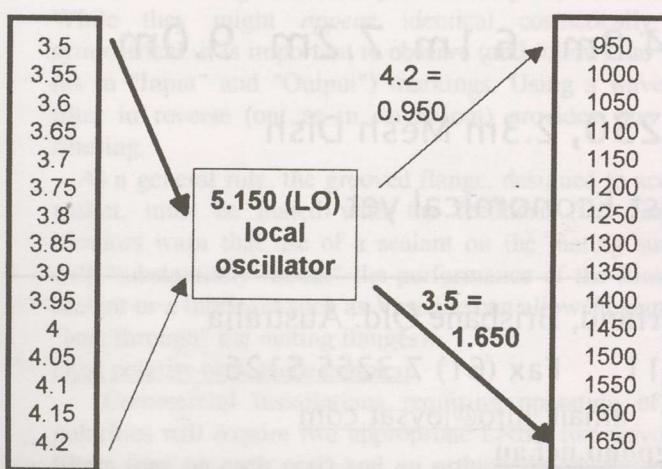
SatFACTS #123 (November) reported on the availability of the Unaohm model S 20 handheld (Satellite Digital and Analogue) meter. The timing of the report and the many unusual features of this instrument could not be better for Australian installers where the existence or immediate threat of the new 3.4 - 3.6 GHz terrestrial broadband Internet "wireless" service is creating an entirely new set of challenges for C band.

Briefly: UNwired is a trading name for a terrestrial service that places hundreds of new 1 to 10 watt terrestrial transmitters on tall buildings and towers using frequencies such as 3.425 or 3.575 GHz. UNwired literature describes how their sites can contact portable or fixed computers "up to 10km distant" from each site using microwave point to multipoint technology. Each transmitter site for UNwired is a potential source of severe interference for C band satellite users. Moreover, UNwired customers have "wireless modems" which are in fact 50-100 milliwatt wireless transmitters operating in the same 3.4 - 3.6 GHz frequency range. An area of the size of Sydney (or Melbourne) will have as many as 200 of these 1 - 10 watt transmitter sites and virtually every home and business district will be within "coverage" of one or more sites. Now, add to those sites the thousands of remote sites (the fixed or portable PCs operating as a part of this network) and you have something approaching chaos for the unwitting C band user.

Experience to date (see p. 6, here) illustrates that while a high percentage of these interference cases can be corrected with proper application of available interference-fighting-tools, ultimately success or failure will come down to the skills of the technician called to the job. And for that you must have absolute hard knowledge of what is happening to the non-desired interference signal while you attempt various fixes. And that says you must have the ability to "tune in" the interference before you can *tune it out*!



C-band LNBs have the local oscillator above (higher than) the actual C-band frequencies, causing the L-band "display" to reverse - lower C (such as 3.575GHz) appears to right of higher frequencies such as 4GHz.



S 20 Operating Controls

(see diagram to left)

1/ Shaft encoder (sets user parameters including menu access); **2/ External power** (operations, charging); **3/ 128 x 64 point LCD readout**; **4/ RF input connector** (has right angle adapter); **5/ Softkey function windows** (see following); **6/ Soft key entry**, enables soft key menus; **7/ Enter** (enters or confirms selections from soft key, shaft encoder and numerical keypad); **8/ Menu** (accessing settings, config menu); **9/ LNB On/Off**; **10/ ATT A/M**. 10 dB per step attenuator (to 30 dB; in MEAsurements function alternates autoranging and manual); **11/ LNB voltage** (13/18 V selection); **12/ 22 kHz** (tone on, off); **13/ Hold** (spectrum function); **14/ DSQ** (toggles DiSEqC commands); **15/ BER** (prompts BER display to appear); **16/ PR** (selects programming tuning); **17/ FR>** (Frequency tuning; shifts cursor over frequency digits for shaft encoder tuning); **18/ LO** (displays L-band frequency or C/Ku transponder frequency - option of four LNB local oscillator settings); **19/ ON/OFF** (press for few seconds to activate); **20/ STORE**. Press twice, rapidly, stores current setting for recall; **21/ Alphanumeric keypad**; **22/ SPECT** (activates spectrum function); **23/ MEA** (activates measurement function); **24/ MKR** (activates one of two markers); **25/ DIGI/ANLG** (allows signal level measurement based upon active marker setting); **26/ PWR** (confirms unit is powered); **27/ Ch.** (indicates battery is charging and external p/s V is available on jack; **28/ Power supply jack** - use with optional external battery pack (Unaohm BP6); **29/ RS232 connector**.

Battery use: Requires two initial charge/discharge (arrives discharged) cycles before use (can however be used with charger supply on bench). Charged battery equals approximately 90 minutes continuous use. Use on bench with external supply requires special (heat related) cautions; Ni-MH family batteries, no memory affects.

S 20 as an interference finder

Because the S 20 includes its own dot matrix LCD display supported with suitable software to create a "visual spectrum display" you hold in your hand the ability to tune in and actually "see" the interference carrier(s). Because they are very strong (up to 70 dB stronger than your typical satellite signal) you may not be able to simultaneously view the full scale of the UNwired carriers and the much weaker satellite signals simultaneously. Here's why:

The S 20 has something called "dynamic display range" which means the 71 x 39mm display "screen" is limited by internal circuits to a range of approximately 60 dB between the strongest signal shown and the weakest signal displayed. However, S 20 controls allow you to determine "which 60 dB" of signal range is displayed - whether it be the strongest 60 or the weakest 60. Therefore you can tune in the UNwired carriers such that they reach the top of the display and your satellite signals, if 70 dB weaker, will not appear. Or, you can readjust the S 20 to allow the tops of the strongest signals to disappear (above the screen top) while now viewing simultaneously the much weaker distant-sourced satellite signals. This "one or the other" either/or choice works to your advantage.

In normal satellite work, which is of course what the S 20 was created to do, your challenge is quite the opposite of dealing with UNwired carriers. But the principal is the same. For satellite reception system installation and signal level peaking, you want to know (from the S 20) when you have the strongest satellite signal, and, the lowest BER (Bit Error Rate). All of the software tools are present to do this. The S 20 installs in the system either at the antenna immediately after the LNB(f) - which is why its' 0.9kg weight and handheld configuration was designed to allow you to be on a roof and make measurements at the dish - or alternately inside where the RG/6 cable comes to the receiver.

But for a C band install where UNwired terrestrial interference (TI) is a problem, you may not even be able to locate the satellite signal(s) until the adverse effects of the UNwired carriers are corrected. Let's play hardball.

1/ The C band dish has been situated where there is an abundance of UNwired signal level. Sitting at the dish, with the S 20 plugged in to the LNB, no matter which "range" you

select all you see is mountain-topping height UNwired carriers. You know what they are because using the S 20's built-in markers, and the front panel knob, you can dial the marker to the UNwired carrier's frequency and read out two facts:

- a/ The frequency of the UNwired carrier(s)
- b/ The actual signal level (in dBuV, dBmV or dBm as suits you)

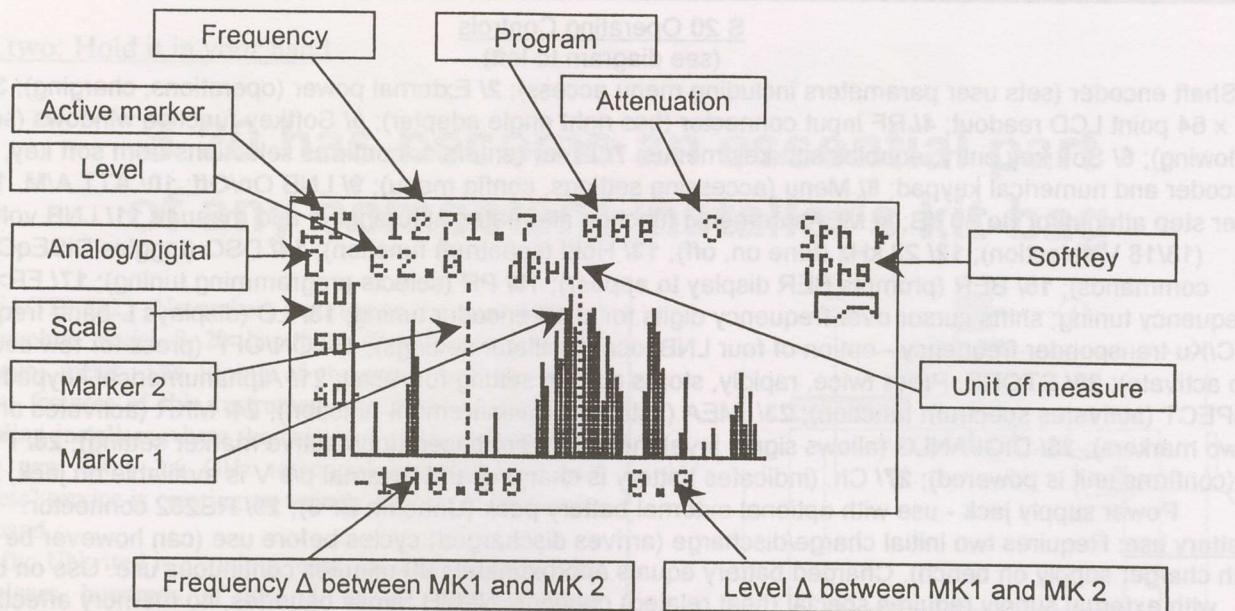
The BER/MER functions will not tell you anything because the digital format of the UNwired signals differs from the QPSK of the designed-for satellite TV signals. And when you cannot even detect the satellite signals, you come to a reasoned conclusion:

"The LNB is overloaded - the UNwired signals are so strong that it is impossible to even find the satellite signals."

This is very useful knowledge because now you have begun to tackle the UNwired signals. Can you make them weaker by repositioning the dish? How about replacing the LNB with a higher grade LNB? If you tell the S 20 to only look at the horizontal polarity (UNwired is vertical), can you find *any* sign of satellite signals using just horizontal? Can you substitute a single pole feed in front of the LNB and concentrate only on the cross-poled horizontal satellite signals?

For each change you attempt, the S 20 will tell you what is happening with the non-wanted UNwired signal level - to the nearest 1/10th of a dB. In those changes you may well find a combination of LNB, feed, and antenna position where the UNwired interference drops by say 30 dB, thereby permitting for the first time the interception and display of pico-watt powered satellite signals. And now, for the first time, when you adjust the S 20 to the satellite signals you have S 20 proof that the signals are "locked" (the S 20 will tell you this) as well as the BER/MER critical numbers of quality. You, and the S 20, have turned what initially appeared to be a hopeless situation, into reception - at least at the antenna.

Remember (from SF#123, p. 6), BER is the "holy grail" of digital satellite reception. Furthermore, it is a qualitative measurement - a "proof of performance" where you can actually see and verify in real numbers not just that you have reception but how much "protection" you have above the magical "signal locked" level.



Heading inside

Assuming you have worked out the antenna + LNB functional, move indoors to the IRD. Start by connecting the S 20 to the receiver end of the RG/6 and remeasure. Unless there is an exceptionally long run of RG/6, the only real change from at the antenna should be the indicated signal level (it will of course be down or lower by a few dB - reflecting the loss in the RG/6 from outside to inside).

But let us assume that is not the case. That the BER/MER have made a quantum decline (for the worse). What could be causing this?

1/ The most likely cause of the problem is the RG/6 run itself - some portion of it is picking up UNwired signal, direct, coupling the energy into the line and causing the BER/MER to go whacko on the S 20.

First of all, you read the meter and made a note (mental or written down) of the "after fix" UNwired signal levels at the antenna, before the RG/6 run. Measure them again, after the run. If the levels have bounced back up, it is RG/6 line pickup between the dish and the inside end. Solution? Better cable, reinspect the F connector at the LNB (no star or hex crimps here - must be a compression crimp!). Or, cast a critical eye at the RG/6 run. Any segments of the run that hang vertical (such as running down the side of a pipe, building) are in the same polarity (vertical) as the UNwired signal(s). By encasing them in metal (not plastic!) conduit, you will create better shielding and this should totally eliminate the RG/6 pickup of the UNwired signal(s).

2/ Inspect the F connector on the indoor end as well - again, not star or hex crimped. Compression fit; *only*.

Now perhaps the BER/MER indicate an acceptable level on the S 20 but when you connect to the actual receiver, it fails to function properly. Setting aside the receiver is crook, perhaps it is merely not capable of handling the remaining level of UNwired signals. In other words, the S 20 is a "higher grade" or more overload proof device than the IRD itself. A receiver that won't work after you have verified the BER/MER with the S 20 is headed for replacement (there is a range of IRDs these days and not all share the same ability to deal with overload level out-of-band signals). Translation? The S 20 says everything is OK, the IRD won't play. Replace the IRD. It is a loser.

In the non-UNwired world?

While several thousand UNwired licenses have been granted by the ABA, and it may be a year or two before an UNwired network cranks up in your backyard (such as Launceston, Tasmania), if the initial commercial rollouts in places like Sydney and Melbourne prove commercially successful, sooner than later it will be in your neighbourhood as well. A given. Of course the longer it takes to get there, the more we learn about dealing with it. That's the good news.

In the non-UNwired world, the S 20 is your basic "define it - fix it" tool of reference. A spectrum analyser is nice but lacking in BER/MER information. An inline meter is less nice - fine for guys who don't really care whether they do the job correctly, only if it is good enough to get paid and then evaporate into the sunset.

There is - presently - no real competition to the S 20. Yes, at nearly A\$2,200 per handheld, it is a major investment for installers who trundle along doing Foxtel or Austar installs at minimum wage (Tech Rentals is another option - weekly or monthly rental of the instrument; in NZ 09 353 4100; in Australia, through Laceys.tv.). But it is also their passport to better jobs that pay more because they *are* more complex and require greater knowledge to execute. And even these guys would do a better job, faster, with the S 20 (in a business environment where faster installs means more per day and therefore more minimum wage dollars per install, net).

Foxtel and Austar are heading for a world of twin satellites (D1 and C1 at 156E) where the present 12.25 - 12.75 GHz range of frequencies will be increased to include a segment in the 11 GHz range as well (11.75 - 12.25 seems likely). What this will mean is two satellites, co-located (in the European fashion) at the same (give or take 114km) spot in space will be pumping back to Australia twice the present number of transponders with at least double the current quantity of programming channels. Life for the installer is going to become ever more complex. The inline meter will become totally inadequate, and cross pole separation (making dead certain the vertical probe is "nulled" from the horizontal waveform) will become even more essential than it is today. Additionally because some of the new D1 satellite capacity is

actually intended for New Zealand, the Kiwi satellite world is taking on a new flavour not even conceptualised 6 months ago. Bottom line? Many more signals, some of which will be FTA, and many of which will require a combo dish system capable of feeding simultaneously Ku band from one bird and C-band from another. Yes, even in New Zealand, the

future says "inline meters" are headed for a dusty spot on your work bench shelf.

The S 20? Available through Lacey's (61-3) 9783 2388 at the professional price of A\$2198 (plus GST in Australia). When a better or more price-competitive instrument is available, we'll review it, here. *For now, this is the one.*

Where have all of the "good" feeds gone?

Tim Alderman: An informal study of old & new C band feeds

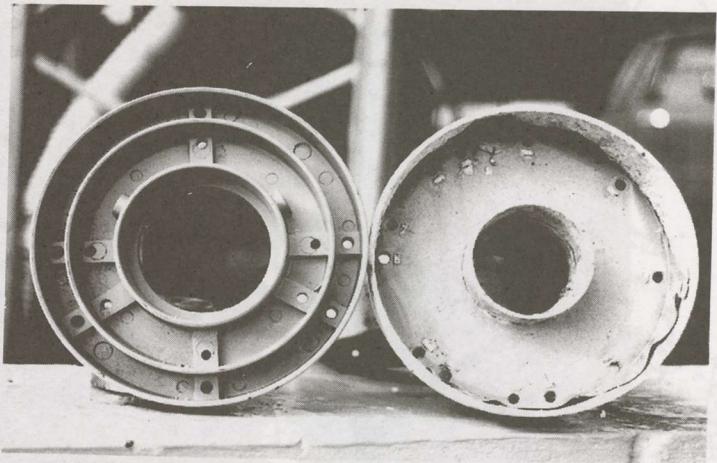
In 1984 I read a magazine article that changed my life. It spoke of signals crossing borders which I heard as a child with shortwave (radio). Determined to find the best, I visited fifteen showrooms and was thrown out of all but two because my technical background allowed me to ask questions which the folks tending the shops could not answer. I finally found Myron Cohen who was the only dealer willing to come to my backyard to do a site survey. We became friends while I completed a 5-month after-hours free apprenticeship to learn how to install dishes and feeds. Through this I held onto my "day job" in telecommunications and volunteering to build a satellite dish owner radio station at night. When my work in telecommunications became erratic, Myron would hire me to crawl under rich folk's houses to string TVRO cabling. I also had the opportunity in 1996 to visit New Zealand and teach "feedhorn technology" during the SPTS event in Auckland.

Myron and I have always held different views about feedhorns. I had become a firm devotee of the National ADL brand while Myron routinely used "brand C" (Chaparral) which at the time held 80% of the marketplace. Perhaps I'm just a sucker for the underdog.

The (ADL) RP1 is a designation for the "moded" design type of feed which is capable of providing a theoretical 0.2dB improvement over the more common scalar ring design used by everyone but ADL and also-ran Miralite. Gerry Blachley, the creator of ADL, told me how he was forced to introduce the (model) RP3 which featured a scalar ring design (ala Chaparral), "to make our feeds look more like the competition." The RP1 was, and remains today under a different brand name, a "shallow dish" design with superior sidelobe performance, all other things being equal.

(Editor's note. The 'scalar ring' has the more impressive 'structure' perhaps because there are more parts. In the 1980 C-band world, those selling "scalar" against "moded" lost no opportunity to tell under educated potential buyers of their sales pitch. Alderman is correct - each has a particular advantage and neither is best under all circumstances.)

FCC licensed 'Microwave Engineer' Alderman was a pioneer in the 1980's C band era of home TVRO and today is a consultant in the DTH world. Tim is a frequent contributor to SatFACTS and makes his C band satellite skills available "for hire" on a consulting basis worldwide.
manager@electron.org



TWO feed designs: "Moded" (right) and "Scalar." Mode design looks to be "simplistic" but is in fact slightly superior in efficiency and sidelobe performance when used with a shallow (.4 f/D region) dish.

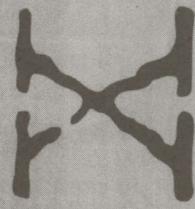
More recently following twists and turns in C-band TVRO. I was back working for Myron and he agreed to allow a series of side by side comparative feed evaluations. But in the interim, ADL had been sold to Patriot Antenna and in the interest of economy (or perhaps perceived improvements) the original RP-1 had become a different RP1- OR100. It would be more than a "brand label" change.

I took the Patriot version to a customer site thinking I would get the same performance as with the older National original. Over time, the National had developed a well earned reputation as the best performing ortho-mode feed when the installation required a pair of LNBs (one for each polarity). "Best" in this case had been documented as the greatest cross-pole isolation and lowest through loss. This time the installation baffled me - it is nominally a 30 minute task to install an ortho-mode feed with two LNBs, peak for best reception and be gone. Five hours into it I threw in the sponge, grabbed a Chaparral and completed the chore but not as a happy camper.

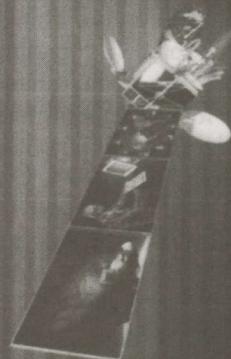
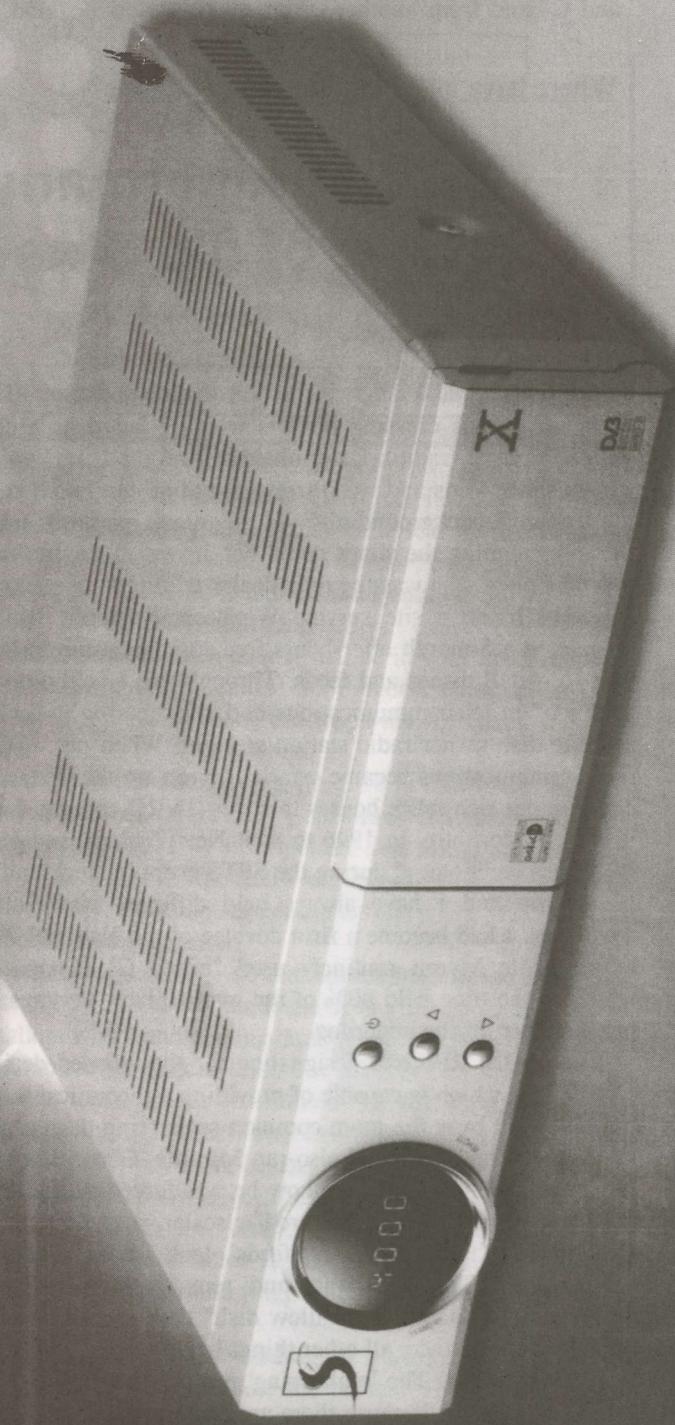
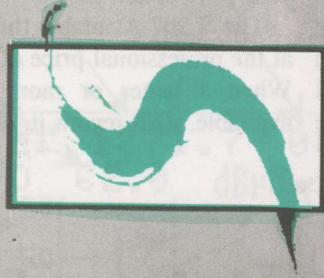
Test results

American satellite C4 on two adjacent transponders (9 and 10 but of opposite polarity) became a backyard test signal source; I wanted to understand what was happening here.

Using my 12 foot dish, the now rather well broken in National version RP1-100 was swapped out for the new



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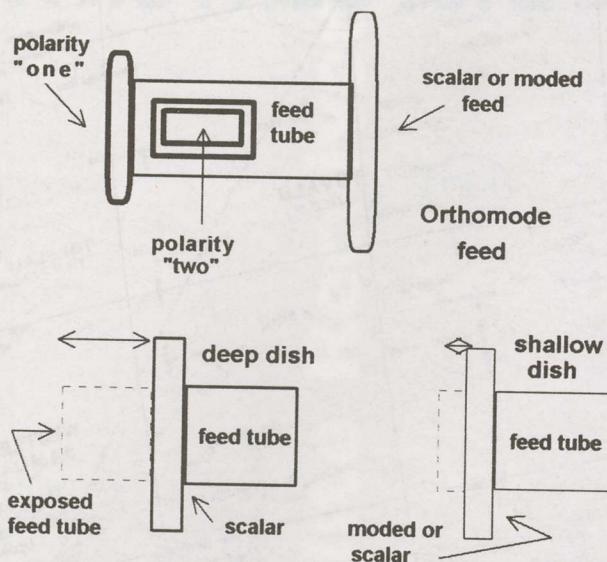
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Intelsat I701 C-band
coverage for Fiji TV.

Power applied to only one LNB (at a time)

| Chaparral Superfeed | National ADL RP1 | Patriot ADL RP1 | Patriot ADL RP3 | Miralite w/scalar |
|--|------------------|------------------|-----------------|-------------------|
| TR9/96 | TR9/96 | TR9/95 | TR9/85 | TR9/96 |
| TR10/95 | TR10/92 | TR10/51 (tiling) | TR10/86 | TR10/95 |
| Power applied to both LNBs simultaneously | | | | |
| n/a (single pole) | not tested | Tr9/96 | Tr9/95 | not tested |



Patriot version. First observation: The settings for polarity (how the feed rotates in the collar for peak performance on each of the two polarities, and conversely how the feed nulls the undesired opposite polarity) changed significantly. If the feeds were more or less identical, swapping one for the other should have no such effect. Puzzled, I pondered whether something unusual was happening with the LNBs attached to the Patriot version and turned off the voltage to one of the two. Immediately the remaining LNB acted differently (I was independently monitoring performance of each LNB/polarity). Now, with power on only one LNB but both LNBs still attached to the feed, the rotation of the feed adjustment for best performance coupled with highest cross pole rejection returned to the same physical setting as the original National version of the same feed. *Strange.*

Returning power to the second LNB, instantly I lost 3dB in signal level and the feed had to be rotated 45 degrees to re-establish peak cross pole isolation. Even stranger?

Some history. LNBs, back in the 1980s, routinely included an input port device termed an "isolator." Think of an "isolator" as a one-way valve in a water system. It allows electrons to flow in one direction (from outside to inside through the LNB flange port) but significantly attenuates any reverse direction flow. One does not normally associate "outward flow" to a LNB but it is there none the less - largely from the DRO/local oscillator.

In my "boneyard" (collection of old but still serviceable hardware) I located a pair of MSE (brand) LNBs, perhaps twenty years in age, which were still manufactured with isolators. Another instant improvement - one of the two

identical Norsat brand "recent vintage" LNBs was creating a 3 dB signal loss and a much more objectionable 17dB polarisation isolation loss when both had power applied.

It is important to note that the original National brand ADL RP1-OR100 could handle the two Norsat LNBs without degradation whereas the Patriot rebranded version of the same feed could not - without degradation. To verify my initial results, I unpacked a second Patriot near-identical device and recalibrated the system. This one had slightly less insertion loss (closer to 2dB than 3dB) and slightly better polarisation "skew" than the first Patriot device but still nowhere near the benchmark performance of the original National ADL.

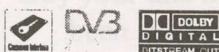
Back to Myron's storehouse and between his new stock and my boneyard's collection, a number of additional different feeds. The Patriot RP3-OR100 (the one with the scalar rings rather than the "moded" ring design) actually came closest to the original "National" version in performance - 1dB greater insertion loss and around 3dB of cross pole deformity. Now on a roll and with the test gear sitting there all set up, I installed a Chaparral "Superfeed" which was set for a shallow dish (0.4 f/d). I expected it to be slightly better for cross pole isolation (partly a function of the shallow dish feed focal point design), and it was. Not by much, but by a dB or so.

Next up was a Miralite "Miracle Feed," a dual polarity design to be used with a scalar feed. That meant it should go on a "deep dish" (such as an f/D of 0.3) but not in my backyard) so necessity became the father of invention and I substituted a Patriot ADL RP3 scalar front end. This resulted in performance almost identical to the original National ADL RP1-OR100. With an adjustable throat, I confirmed than 1/8" past the scalar ring was the best performance point for this combination. Five different measured configurations are shown above using a 4DTV receiver where their internal software number of 100 represents something the receiver designer labels "perfect." Each number represents the peaked performance after the feed or combination was optimised.

It appears ...

...to me that Patriot has somehow compromised the design of the original National ADL RP1-OR100. This might not be an issue if LNBs were still routinely supplied with isolators as a part of the LNB design - alas that is true now only with the much more expensive commercial product LNBs. Your first clue will be only obvious after you compare the performance of the Patriot RP1-OR100 with first one, then the other and finally both LNBs "turned on." If you adjust the feed rotation for best signal level/gain on the single turned on LNB and verify this is also the best position for the cross-pole null, and finally turn both LNBs on and recheck for best rotation of the throat versus gain and cross pole nulling, you will perhaps

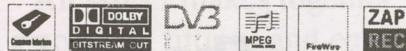
homenet eM200



Digital Satellite Receiver with 2 x CI slots.
and Irdeto 2.09 CI cam.

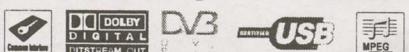
SATELLITE

homenet eM320PVR



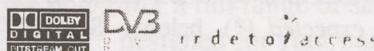
Satellite Receiver with Dual Tuner, firewire,
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homenet eM300PVR

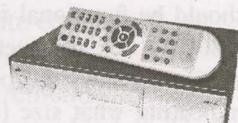


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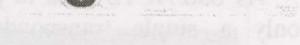
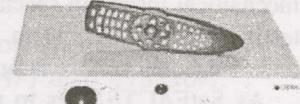


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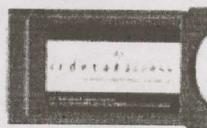
DG-120
DiSEqC H-H Mount

EZ-2000
EZ-4000
EZ-6000
VBOX II DiSEqC 1.2

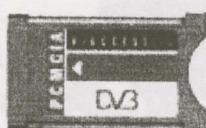
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iaccess 2.5 cams

verify my own findings. In a marginal C band situation, it may not be possible to use this feed with both poles "active"

unless you can locate isolator equipped LNBs. Bottom line? Not all dual-mode feeds are created equal; beware!

Fiji's SKY Pacific Saga continues

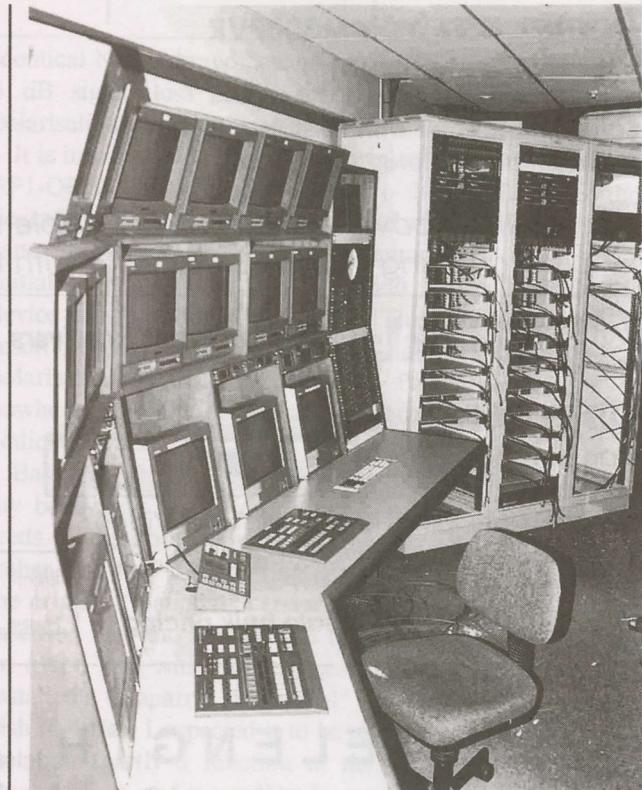
The "C-BAND" solution

As you read this update report, Fiji Sky Pacific satellite TV should be functional in at least a C-band test mode on I701 (180E) - see parameters *expected* (*), below. SatFACTS #123 published the projected C-band footprint and a table indicating what size (C-band) dish should function for each of the 19+ Pacific Island nations covered by the new service.

The projected EIRP beam centre signal level is 38.7 dBw and the centre is on Fiji proper. The C-band circular feed problem has been resolved to the satisfaction of Fiji TV, using a combination of circular designed feeds and "Teflon Slab" mechanical inserts in specially created linear feeds. Extensive testing with dishes 90cm through 1.5m will be conducted once the actual service is functional.

As SatFACTS goes to press, there is the possibility that only a single transponder space will be available 15 December - translating to 6 initial channels. Intelsat has to move some existing services around to hand over to Fiji TV the second transponder - hopefully by 1 January (at which time the total number of channels will grow to 11/12 plus radio). Service from mid-December through approximately 1 March will be with a 6 GHz uplink "FlyAway" terminal brought in to get Fiji TV on the air. Conversion of the existing 14 GHz uplink 6.3m Vertex dish and the required 6 GHz transmitter will last through at least February. The dish feed, waveguide, the transmitter proper plus various control and forced air cooling systems must be changed out to accommodate the 6 uplink GHz conversion.

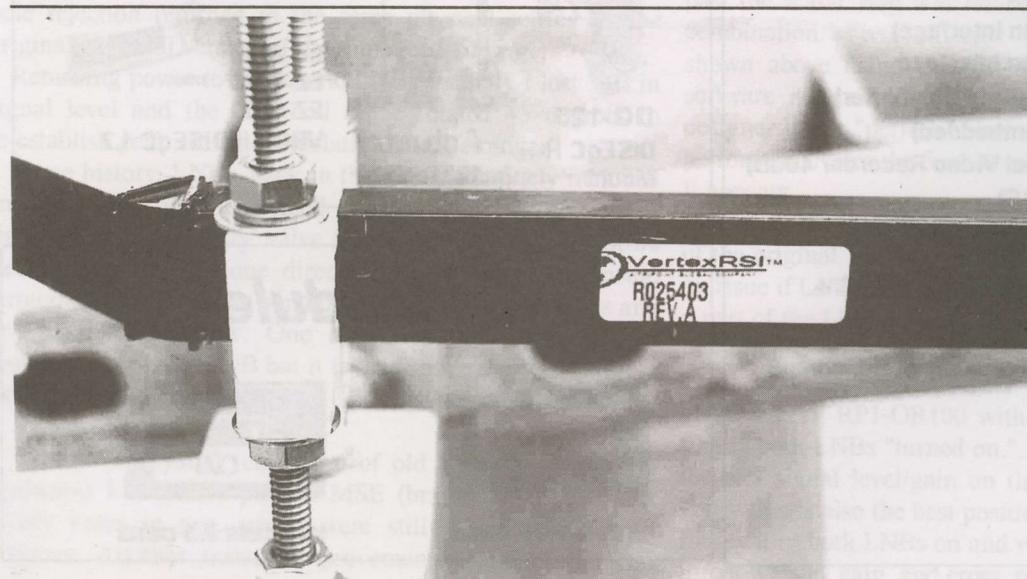
Installer contacts? If you wish to handle installations for Sky Pacific, contact Tarun Patel (Email tpatrick@fijitv.com.fj; telephone ++679 3305 100, fax ++679 3308 470). Those who have previously contacted Fiji TV about this should redo their query using the instructions here. A policy regarding out of



Fiji Sky Pacific control room - scheduled light-up date December 15. (Below) Complete rebuild of uplink site will include replacing 14 GHz waveguide with 6 GHz.

Fiji installations concerning who provides the hardware will be reached during January-February.

Over the coming months, Fiji TV will be a major cause of hardware sales as more than 300,000 Fiji born individuals are now living in New Zealand and Australia. Fiji One TV is FTA and requires no "grey market" Nagravision cards; our comments on this appear on page 1. It is all go.



| Sky Pacific Parameters |
|--|
| Intelsat I701/180E |
| 4.055 GHz RHC (*) |
| Sr 33.008 (*) |
| FEC 2/3 (*) |
| FTA: Fiji One TV |
| Nagravision 2: 11 TV + up to 10 radio |
| * - These are <u>NOT</u> firm numbers! |

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TECHNICAL TOPIX

SF#123 reported on our initial evaluation of the Unaohm S 20 measurement instrument; the report completes in this issue (p. 12). The supplier of this instrument series, Laceys.tv, has supplied a response to our November report and it follows.

"1. **CFO**, a function within BER, is something special that Unaohm do. Centre frequency offset (CFO) shows the accuracy of the LNB(f) local oscillator. This is useful information - could avoid a call-back to replace a poor LNB before leaving the job.

"2. Whilst you wrote highly of BER, I would like to make some additional observations.

Ch BER is the meat and potatoes BER that says good or bad quality.

Pv BER shows how effectively the Viterbi corrector is working, a confirmation of overall corrector function.

RU (Reed Solomon Uncorrected) is a cliff edge indicator. Now we measure damaged packets rather than bits because they occur much less frequently. That's why a timer showing elapsed hours/minutes and seconds since lock was last lost is helpful, just in case lock was lost while you were away tidying up the installation. The presence of damaged packets indicates precarious closeness to signal (reception) loss. One way to imagine this - it is the receiver's digital frame store standing between picture interruption(s). The total RU error count stops at around 5,000 which might seem a relatively small number, but a signal with that many damaged packets is poor indeed.

MER is an overall measure of Digital Signal Quality that helps when fine tuning BER, especially with (say) a high quality Ku band signal. Yes, it is similar to C/N (in analogue) but real digital MER includes all impairments, even within the transponder; a number simply not possible to measure with analogue C/N.

"3. The Ch BER measures the report mentions sound as if they were done primarily on C-band. However, the Ku band Pay TV beams present over the east coast of Australia, and through Sky in New Zealand, typically give BERs in the E-5 range. Seldom is anything above E-7 measured.

"4. A function Foxtel has found especially useful is the ability to monitor transponders in the Vertical and Horizontal polarities simultaneously. By selecting (as an example) 3 Tr in horizontal and 4 Tr in vertical, the Histogram function will show both polarities simultaneously. From there the operator can move

our markers to measure the differences in signal levels and frequency.

"5. The report mentions measurement integrity. We all know there is a host of competitors in this field, however we believe there is nothing else in the price range of the S 20 which measures BER/MER properly and accurately. The S 20 has the identical measurement integrity as Unaohm's top line EP3000, and remains the only MDU instrument with Foxtel approval; this after they spent several months evaluating every instrument they could lay their hands on, against a \$20,000 Rhode and Schwartz laboratory standard.

"6. You suggested that a training videotape could be created to assist first time users in learning all of the special tricks that come prepackaged with the S 20. Pietro Casoar, who did some videotaped instruction pieces for SPACE Pacific years ago, is our professional SMATV chap while Mark Bryant is our instrument specialist. Mark is, we believe, the best guy on this subject in Australia. He can be reached through Laceys.tv Frankston through markb@laceys.tv.

"7. We do provide a CD for the S 20 that incorporates Powerpoint training presentations with various software routines. Because of the simplicity of the Power Point, our workload required to make a training video, we have not stepped up to the 'movie plate' yet. But - thinking about it!"

Peter Lacey of Laceys.TV

We remain in favour of a S 20 video training tape. Pietro has the experience to "direct" this even if Mark is the "star" for this particular issue. And - by offering a copy of the tape to prospective buyers of the S 20, you will have a first rate sales tool as well as the training aspects covered.

Data Log of all Foxtel transponders provided by S 20C instrument; a permanent record!

| ACQ | PG | FREQMHz | LEV dBuV | STATE | CHBER | PVBER | MER dB |
|--------|----|---------|----------|----------|----------|----------|--------|
| 1/ 1#a | 1 | 1605 | D 78.1 | UNLOCKED | ----- | ----- | --- |
| 1/ 2#a | 2 | 1667 | D 86.0 | LOCKED | 6.48E-06 | 0.00E+00 | 12.5 |
| 1/ 3#a | 3 | 1707 | D 79.7 | LOCKED | 7.76E-04 | 0.00E+00 | 9.7 |
| 1/ 4#a | 4 | 1747 | D 82.5 | LOCKED | 1.25E-05 | 0.00E+00 | 12.2 |
| 1/ 5#a | 5 | 1787 | D 80.8 | LOCKED | 1.57E-05 | 0.00E+00 | 11.9 |
| 1/ 6#a | 6 | 1827 | D 79.7 | LOCKED | 1.14E-05 | 0.00E+00 | 11.8 |
| 1/ 7#a | 7 | 1867 | D 78.9 | LOCKED | 4.77E-06 | 0.00E+00 | 12.9 |
| 2/ 1#a | 8 | 1907 | D 76.6 | LOCKED | 5.09E-06 | 0.00E+00 | 13.4 |
| 2/ 2#a | 9 | 1947 | D 77.0 | LOCKED | 6.17E-06 | 0.00E+00 | 13 |
| 2/ 3#a | 10 | 2020 | D 77.6 | LOCKED | 2.29E-06 | 0.00E+00 | 13.2 |
| 2/ 4#a | 11 | 1605 | D 80.7 | LOCKED | 7.06E-06 | 0.00E+00 | 12.5 |
| 2/ 5#a | 12 | 1658 | D 78.7 | LOCKED | 7.57E-06 | 0.00E+00 | 12.9 |
| 2/ 6#a | 13 | 1698 | D 77.3 | LOCKED | 1.04E-05 | 0.00E+00 | 12.8 |
| 2/ 7#a | 14 | 1738 | D 75.6 | LOCKED | 1.49E-05 | 0.00E+00 | 12.9 |
| 3/ 1#a | 15 | 1778 | D 73.9 | LOCKED | 2.25E-05 | 0.00E+00 | 13 |
| 3/ 2#a | 16 | 1818 | D 72.3 | LOCKED | 4.83E-05 | 0.00E+00 | 12.8 |
| 3/ 3#a | 17 | 1858 | D 71.9 | LOCKED | 2.24E-05 | 0.00E+00 | 12.5 |
| 3/ 4#a | 18 | 1898 | D 72.4 | LOCKED | 1.75E-05 | 0.00E+00 | 13 |
| 3/ 5#a | 19 | 1938 | D 71.7 | LOCKED | 1.12E-05 | 0.00E+00 | 12.9 |
| 3/ 6#a | 20 | 1988 | D 70.8 | LOCKED | 2.61E-06 | 0.00E+00 | 14 |
| 3/ 7#a | 0 | | | | | | |

SatFACTS Pacific/Asian MPEG-2 Digital Watch: 15 DEC, 2004

| Bird | Service | RF/IF &Polarity | # Program Channels | FEC | Msym |
|-------------|------------------------|--------------------------------|--------------------|-----|----------|
| Them3/78.5 | SkyChAust | 3695/1455H | up to 3 | 3/4 | 5(,000) |
| | ANT Greece | 3672/1478H | 1 TV | 3/4 | 13(,333) |
| | Korean Central | 3665/1485H | 1 | 2/3 | 3(,367) |
| | TARBS ME mux | 3640/1510H | 12TV, 12 radio | 2/3 | 28(,066) |
| | Ch Nepal | 3626/1524V | 1 | 3/4 | 15(,556) |
| | Mahar mux | 3600/1550H | 11TV, 1 rad | 3/4 | 26(,667) |
| | SE asia Mux | 3569/1581H | 2+ TV | 3/4 | 12(,500) |
| | RR Sat mux | 3551/1600H | 8TV, 10 radio | 3/4 | 13(,333) |
| | JAiN TV | 3538/1612V | 1TV | 3/4 | 3(,300) |
| | PTV1 + | 3521/1629V | 1TV, 1 radio | 3/4 | 3(,333) |
| | FTA Mux | 3520/1630H | 12TV, 12 radio | 3/4 | 29(,800) |
| | KTN plus | 3500/1650H | 2+ TV | 3/4 | 26(,667) |
| | TVK Cambodia | 3448/1702H | 1TV | 1/2 | 6(,312) |
| | TARBS/Th5 | 3480/1670H | 12 TV+radio | 2/3 | 26(,667) |
| | KCTV/Korea | 3424/1726H | 1TV | 3/4 | 3(,366) |
| | Thai Global | 3425/1725V | up to 7? | 2/3 | 27(,500) |
| InSat 2E/83 | ETV mux | 4005/1145V | 6+ TV | 3/4 | 27(,000) |
| | Hyd Dig 2E | 3910/1240V | 1 | 3/4 | 5(,000) |
| | Kairali TV | 3699/1451V | 1 | 3/4 | 3(,184) |
| | Indian mux | 3643/1507V | 3 | 3/4 | 19(,531) |
| | ETV Mux#2 | 3485/1665V | 4+TV | 3/4 | 27(,000) |
| | Sky Bangla | 3430/1720V | 1TV | 3/4 | 6(,000) |
| NSS6/95E | Ant Pac (Greek) | 11.104H-Australia | 1 TV | 3/4 | 2(,800) |
| As2/100.5E | Guangdong TV | 4075/1075H | 1TV + radio | 3/4 | 6(,000) |
| | Euro Bouqt | 4000/1150H | 6TV, 21r | 3/4 | 28(,125) |
| | Reuters News | 3905/1245H | 1TV | 3/4 | 4(,000) |
| | WorldNet | 3880/1270H | 4+/28radio | 1/2 | 20(,400) |
| | APTN Asia | 3799/1351H | 1 | 3/4 | 5(,632) |
| | Reuters/Sing. | 3775/1375H | 1 | 3/4 | 5(,631) |
| | Macau MUX | 4148/1002V | 5TV | 3/4 | 11(,850) |
| | Feeds | 4086/1064V | 1 | 3/4 | 5(,632) |
| | Dubai MUX | 4020/11430V | 4+, radio | 3/4 | 27(,500) |
| | Fashion TV | 3795/1355V | 1 | 3/4 | 2(,626) |
| | 3-ch miniMUX | 3752/1398V | up to 3 | 3/4 | 5(,640) |
| | Saudi TV1 | 3660/1490V | 7+/tests | 3/4 | 27(,500) |
| As3S/105.5E | Telstra 1-Net | 12.596V | no TV | 5/6 | 30(,000) |
| | RR Mux | 3669/1481V | up to 5 TV | 3/4 | 13(,333) |
| | Zee bouquet | 3700/1450V | 10TV | 3/4 | 27(,500) |
| | Ch News Asia | 3706/1444H | 1TV (+) | 3/4 | 6(,000) |
| | BTW World | 3725/1425V | 1TV | 3/4 | 4(,450) |
| | SAB TV | 3743/2407V | 1TV | 3/4 | 3(,300) |
| | Arirang TV | 3755/1395V | 1 | 7/8 | 4(,418) |
| | Now TV + | 3760/1390H | up to 8TV | 7/8 | 26(,000) |
| | Star TV | 3780/1370V | 7(+TV) | 3/4 | 28(,100) |
| | GXTV | 3806/1344V | 1TV + 3 radio | 3/4 | 4(,420) |
| | Shaanxi TV | 3813/1337V | 1TV + 2 radio | 3/4 | 4(,420) |
| | Anhui TV | 3820/1330V | 1TV + 2 radio | 3/4 | 4(,420) |
| | Jiangsu TV | 3827/1330V | 1TV + 2 radio | 3/4 | 4(,420) |
| | HLITV | 3834/1316V | 1TV | 3/4 | 4(,420) |
| | Star TV | 3840/1310H | 7(+TV) | 7/8 | 26(,850) |
| | Star TV | 3860/1290V | 5(+TV) | 3/4 | 27(,500) |
| | Abu Dhabi MUX | 3880/1270H | 8+TV, 10Radio | 3/4 | 27(,500) |
| | Dragon TV | 3886/1264V | 1 TV | 3/4 | 4(,800) |
| | Shandong | 3895/1255V | 1TV + 6 radio | 3/4 | 6(,813) |
| | Jilin TV | 3914/1236V | 1TV + 1 radio | 3/4 | 4(,420) |
| | Star TV | 3920/1230H | 4+ TV | 7/8 | 26(,850) |
| | Star TV | 3940/1210V | 6(+TV) | 7/8 | 26(,850) |
| | CNNI | 3960/1190H | 8(+TV) | 3/4 | 27(,500) |
| | StarTV | 3980/1170V | 6+TV | 3/4 | 28(,100) |
| | Star TV | 4000/1150H | 8(+TV) | 7/8 | 26(,850) |
| | Sahara digital | 4020/1130V | 8TV | 3/4 | 27(,250) |
| | Hubei TV | 4035/1115H | 1TV + 2 radio | 3/4 | 4(,420) |
| | Sichuan TV | 4051/1099H | 1TV + 1 radio | 3/4 | 4(,420) |
| | Qinghai TV | 4067/1083H | 1TV + 2 radio | 3/4 | 4(,420) |
| | Hunan TV | 4082/1068H | 1TV + 1 radio | 3/4 | 4(,420) |
| | Pakistani TV | 4091/1059V | 5TV, 1 radio | 3/4 | 13(,333) |
| | Sun TV | 4095/1055H | 1 | 3/4 | 5(,554) |
| | TVB8 Mux | 4110/1040H | 3 | 3/4 | 13(,650) |
| | Indus News | 4115/1035V | 1 | 3/4 | 3(,222) |
| | CCTV bqt | 4129/1021H | 4(+TV) | 3/4 | 13(,240) |
| | Zee Bqt #2 | 4140/1010V | 8(+TV) | 3/4 | 27(,500) |
| | Henan TV | 4166/984V | 1TV + 4 radio | 3/4 | 4(,420) |
| | Fujian TV | 4180/970V | 1TV + 2 radio | 3/4 | 4(,420) |
| | Jiangxi TV | 4187/963V | 1TV + 2 radio | 3/4 | 4(,420) |
| | Liaoning TV | 4194/956V | 1TV + 2 radio | 3/4 | 4(,420) |
| Cak1/107.5 | Indovision | 2.535, 2.565, 2.595, S-band | 33(+TV) | 7/8 | 20(,000) |
| T'Kom/108E | IndoBqt | 3460/1690H | up to 6 | 3/4 | 28(,000) |
| C2M/113E | TPI | 4185/965V | 1 | 3/4 | 6(,700) |
| | TEV Asia-Africa | 4160/990H | 1 | 3/4 | 5(,632) |
| | Amteve | 4144/1006V | 1 | 3/4 | 6(,510) |
| | Kabelvision Mux | 4080/1070H | 7+ TV | 7/8 | 28(,125) |
| | Indostar | 4074/1076V | 1 | 3/4 | 6(,500) |
| | Satelindo | 3935/1215H | 1 | 3/4 | 6(,700) |
| | Bah TV | 3926/1224H | 1 | 3/4 | 4(,208) |
| | Indo MUX | 3880/1270H | 3+ TV | 7/8 | 28(,121) |
| | TVRI | 3765/1385H | 1TV | 3/4 | 5(,555) |

| Receivers and Errata | |
|--|--|
| CA (#1, 3); FTA audio #2 (dm) | |
| Late July 04: room for more (FTA) | |
| Global footprint; changes 02/03 | |
| CA + 2 FTA(A1TV, IRB3)(| |
| New 03/03; FTA | |
| Thai + Indian services; FTA | |
| MRTV3, MRTV (DM) | |
| 3TV, 5radio inc. Hellas TV Greece FTA | |
| PIDs 4132/4133 | |
| frequency change | |
| Aug 04: 5TV, 1 ra FTA (India) | |
| Irdeo 2, apparently SE Asia based (08-04) | |
| FTA | |
| 3FTA: TV5, VTV4, ATN Bangla | |
| Not 24 hour, FTA? | |
| FTA (reaches SE Australia) | |
| Several ETV now here; wide beam | |
| SCPC, OK E. Aust. wide beam | |
| SCPC, OK E. Aust wide beam | |
| corrections 12/02 | |
| Several new ETV here; Asia beam | |
| New - November 2002 | |
| (still) FTA 011-04; was 11.083H | |
| July 04: FTA | |
| FTA TV + radio; TV5 Asia moved "down" April | |
| Was 3923H; sometimes FTA | |
| FTA; multiple audio services V2360, A2320 | |
| Sometimes FTA; also 3895Vt | |
| FTA & CA | |
| 5 chs TV, FTA, some tests | |
| FTA SCPC feeds | |
| FTA , EuroSport PID change (1213/1313) June | |
| FTA as of May 1, 2003 | |
| Sun-TV, Surya TV, KTV (FTA) | |
| FTA MCPC, Yemen, MBC EuroSport tests | |
| Signal useful for dish testing - no TV | |
| Bluekiss adult here; CA cards sales@bluekiss.biz | |
| Now SECA 2 CA (10-04) | |
| New September 2003; English + V1160, A1120 | |
| Bangladesh TV FTA started early March 2004 | |
| FTA SCPC, New PIDs V3601, A3606 June 2003 | |
| CA + NOW, B'berg, Indus Music, MTA, Living FTA | |
| NDS CA (Pace DVS211, Zenith) | |
| Guangxi TV; was As2 | |
| Was As2 | |
| Was As2 | |
| Was As2 | |
| Was As2; HeiLong | |
| NDS CA (Pace DVS211, Zenith) | |
| NDS CA (Pace DVS211, Zenith) | |
| New April 2004: link to Optus B3 Globecast | |
| Shanghai | |
| Apparently Mongolia; was As2 | |
| Was As2 | |
| Star Sports Asia (+), FTA NTSC; V514, A670 (10-04) | |
| NDS CA as above; may NOT be operational | |
| PowVu CA; new SR Apr 29; CNN radio FTA | |
| NDS CA; Star News India FTA VPID 514, APID 648 | |
| NDS CA w/ 4(Chinese) FTA | |
| New Sr September | |
| Was As2 | |
| new Sr, channels, Nov 2003 | |
| "History Channel" - SCPC | |
| MATV Chinese movies FTA +CA; new Sr 05-04 | |
| Hindi (+ "Plus") | |
| moved from 4115 | |
| Now SECA 2 CA (10-04); 1 occ. FTA (varies) | |
| Was As2 | |
| NDS CA using RCA/Thomson, Pace IRDs; 2.535 has 2 FTA | |
| also 3586H/17.500, 3496H/19.615 | |
| FTA SCPA; NT/NC only | |
| New August 2003 | |
| change from 4055V; FTA SCPC | |
| also try 3500H, 27.000, 3/4; strong NZ | |
| FTA (new 06-03); V2201, A2202 | |
| test card - only - reported | |
| FTA, may not be active full time | |
| FTA; Sr change 01/03; erratic | |
| bounces btwn FTA and CA; unreliable (12-04) | |

| Bird | Service | RF/IF & Polarity | # Program Channels | FEC | Msym |
|----------|--------------------------|------------------|---------------------|-----------|--------------|
| | Brunei/Sing | 3733/1417H | 1TV | 3/4 | 6(,000) |
| | SCTV | 3726/1424V | 1TV | 3/4 | 6(,620) |
| | RCTI | 3473/1677H | 2 | 3/4 | 8(,000) |
| As4/122E | Aust DTH test | 12.453V | 2 | 3/4 | 20(,000) |
| | CCTV internal | 4020/1130V | 6 | 3/4 | 27(,500) |
| | CCTV internal | 4100/1050V | 6 | 3/4 | 27(,500) |
| Jc3/128 | Miracle Net | 3996/1154V | 3 up to 6 | 5/6 | 22(,000) |
| | Asian bqt | 3960/1190V | up to 8 | 7/8 | 30(,000) |
| ApS138 | Tests | 3866/1284H | 1 | | 3(,355) |
| Jc2A 154 | BYU-TV | 3915/1245V | 1+languages | 3/4 | 4(,166) |
| MeasSs2 | Astro Mux | 11.602H | up to 17TV | 3/4 | 41(,500) |
| | VTV MUX | 11.522V | 3 TV | 3/4 | 9(,766) |
| B3/152 | AuroraBiz | 12.407V | 4 TV, 10 radio | 2/3 | 30(,000) |
| | Occ feeds | 12.445H | 1TV | 3/4 | 6(,666) |
| | Globecast 2 | 12.525V | 13 TV, 8 radio | 2/3 | 30(,000) |
| | Globecast (feeds) | 12.550-555V | 1TV | 3/4 & 2/3 | 6(,110/.670) |
| | UBI/tests | 12.613H/T14L | 11+TV | 3/4 | 22(,500) |
| | UBI/tests | 12.649H/T14U | 11+TV | 3/4 | 22(,500) |
| | Globecast 1 | 12.658V/T7 | 14TV, 15 radio | 2/3 | 30(,000) |
| | UBI/tests | 12.674H/T15L | 11+TV | 3/4 | 22(,500) |
| | UBI/tests | 12.701H/T15U | 11+TV | 3/4 | 22(,500) |
| | WA ABC | 12.702V | 1 TV, 1 radio | 7/8 | 14(,288) |
| | WA SBS | 12.720V | 4TV, 2 radio | 5/6 | 12(,600) |
| | WA GWN/WIN | 12.738V | 2TV | 7/8 | 14(,295) |
| C1/156E | Optus test bed | 12.324V/1U | 4+ (ABC) TV | 1/2 (*) | 24(,450*) |
| | Pay TV | 12.365V/T2 | 11TV, 2 radio | 3/4 | 27(,800) |
| | Aurora Home | 12.407V/T3 | 5 TV, 13 radio | 2/3 | 30(,000) |
| | Pay-TV | 12.447V/T4 | 5TV, 4 data | 3/4 | 27(,800) |
| | Pay TV (test) | 12.487V/T5 | 3+ TV, data | 3/4 | 27(,800) |
| | Aurora 2 | 12.527V/T6 | 7TV, 20 radio | 3/4 | 30(,000) |
| | Pay-TV | 12.567V/T7 | 10 TV | 3/4 | 27(,800) |
| | Pay-TV | 12.607V/T8 | 10 TV | 3/4 | 27(,800) |
| | Pay-TV | 12.647V/T9 | 10 TV | 3/4 | 27(,800) |
| | Aurora 3 | 12.720V/T10 | 6TV, 16 radio | 3/4 | 30(,000) |
| | Austar | 12.305H/T11 | 6TV, 24 data | 3/4 | 30(,000) |
| | Pay-TV | 12.358H/T12 | 10 TV | 3/4 | 27(,800) |
| | Pay-TV | 12.398H/T13 | 10 TV | 3/4 | 27(,800) |
| | Pay-TV | 12.438H/T14 | 6TV, 3 data | 3/4 | 27(,800) |
| | Pay-TV | 12.478H/T15 | 10 TV | 3/4 | 27(,800) |
| | Pay-TV | 12.518H/T16 | 10 TV | 3/4 | 27(,800) |
| | Pay-TV | 12.558H/T17 | 10 TV | 3/4 | 27(,800) |
| | Pay-TV | 12.598H/T18 | TV | 3/4 | 27(,800) |
| | Pay-TV | 12.638H/T19 | 10TV, 30 radio | 3/4 | 27(,800) |
| | Pay TV | 12.688H/T20 | 11TV | 3/4 | 27(,800) |
| Bl/160 | Tasmania DTV | 12.354H | 1TV | 3/4 | 5(,100) |
| | Occ. feeds | 12.380H | 1 TV - * | 3/4 | 6(,111) |
| | Occ. feeds | 12.384V | 1 TV - * | 3/4 | 6(,111) |
| | Net 7 service | 12.397H | 1 | 3/4 | 7(,200) |
| | Imparja mx | 12.379H | 2TV + 8 radio | 3/4 | 5(,424) |
| | 7 digital feeds | 12.397H | 1TV | 3/4 | 7(,200) |
| | Feeds to NZ | 12.411V | 1 TV | 3/4 | 6(,111) |
| | SBS Mux | 12.420H | 3+ TV, 2+ radio | 5/6 | 12(,600) |
| | TVNZ DTH | 12.456V | 5+TV | 3/4 | 22(,500) |
| | Sky NZ | 12.519/546V | 7TV/7TV | 3/4 | 22(,500) |
| | Sky NZ | 12.581/608V | 6TV/6TV | 3/4 | 22(,500) |
| | Sky NZ | 12.644/671V | 9TV | 3/4 | 22(,500) |
| | ABC HDTV | 12.610H | 5TV | 7/8 | 14(,3288) |
| | Sky NZ | 12.707/734V | 8+TV | 3/4 | 22(,500) |
| | Mix 106.3 | 12.574H | 1 radio + data | 3/4 | 1(,851) |
| P8/169 | ABS-CBN | 12.575H | 4+TV, 4+ radio | 2/3 | 13(,845) |
| | JEDI/TVB | 12.686H | 11+ TV | 3/4 | 28(,126) |
| | ABC A-P | 4180/970H | 2TV, 2 radio | 3/4 | 27(,500) |
| | Disney Pac | 4140/1010H | typ 6 TV | 5/6 | 28(,125) |
| | Taiwanese MUX | 4080/1070H | 12+ TV | 5/6 | 30(,000) |
| | NHK Joho | 4060/1090H | 7TV, 1 radio | 3/4 | 26(,470) |
| | FOX Mux | 4040/1110V | up to 5TV | 7/8 | 26(,470) |
| | NET + | 4121/1029V | 1 TV | 3/4 | 4(,774) |
| | ESPN USA | 4020/1130H | 8+TV, data | 3/4 | 26(,470) |
| | Discovery | 3980/1170H | 8 typ. | 3/4 | 27(,690) |
| | CalBqt/Pas8 | 3940/1210H | up to 3+ FTA | 7/8 | 27(,690) |
| | CNBC HK | 3900/1250H | up to 7TV | 3/4 | 27(,500) |
| | FilipinoMUX | 3880/1270V | up to 8TV+radio | 5/6 | 28(,694) |
| | TaiwanBqt | 3860/1290H | 12TV + 30 r | 5/6 | 28(,000) |
| | CCTV Mux | 3829/1321H | up to 4 + 1 radio | 3/4 | 13(,240) |
| | TVBS-N | 3836/1314V | 1FTA , 4+ CA | 3/4 | 22(,000) |
| | EMTV PNG | 3808/1342V | 1 + 2 radio | 3/4 | 5(,632) |
| | CNNI | 3780/1370H | 3, up to 5 TV | 3/4 | 25(,000) |
| | Discovery Asia | 3764/1386V | Up to 6 TV | 3/4 | 19(,850) |
| | MTV | 3740/1410H | 8 | 2/3 | 27(,500) |
| P2/169E | WA Mux Pv | 12.281V | 3+ TV, radio | 2/3 | 27(,500) |
| | Arlang TV | 12.401V | 1TV | 3/4 | 4(,400) |
| | ABS-CBN | 12.575H | 4TV, 2 radio | 13(,845) | |
| | NBN | 4126/1024V | 1TV | 3/4 | 3(,075) |
| | TARBS feeds | 4090V/1060V | 9TV + radio | 3/4 | 21(,000) |
| | Feeds | 4027/1123H | 1+TV | 2/3 | 6(,620) |
| | Middle East | 3836/1314V | 4 typ | 3/4 | 13(,331) |
| | Feeds | 3803/1347V | 1 | 3/4 | 6(,000) |
| | PAS/BBC mux | 3744/1406V | 3 | 3/4 | 21(,500) |

| Receivers and Errata | |
|--|--|
| FTA : Singapore 23hrs, Brunei 1 hr; Brunei V1200 was on 4048V; New Caledonia, parts of Australia | |
| FTA SCPC; Australia, New Caledonia, some English | |
| Planned Aust DTH; VTV CA, other FTA (10-04) | |
| New Aug '04; Irdet 2 | |
| New Aug '04; Irdet 2 + TVSN oec. FTA | |
| PowerVu; some FTA (Ch. 1 & 3) | |
| CA & FTA NTSC: Japan, Taiwan | |
| 3759/Sr24.843; 3786/Sr5.000, 3846/H/Sr4.292 (NZ) | |
| Erratic service; strong NZ & Australia | |
| Aust East beam - 3 FTA + 14 CA | |
| WA only? Skew path, intended Asia | |
| differs from 12.407C1; tune ch FTA; NZ+Au | |
| Net 10, V8 racing; also 12.452H, same parameters | |
| NZ + Au, FTA - Mrypt CA | |
| oec feeds, NZ + Au; recently 12.553V | |
| High performance beam; not NZ | |
| High performance beam; not NZ | |
| NZ + Au (Mrypt, PowVu capable) | |
| High performance beam; not NZ | |
| High performance beam; not NZ | |
| ABC WA tests, FTA | |
| SBS, radio tests WA FTA | |
| Irdeto V2 CA, tests (GWN, WIN) | |
| new #s 11-04; * may be temporary numbers | |
| Tests; SBS-NDS CA, others FTA when here | |
| NZ (90cm) + Australia (Only svc left on NZ; C1) | |
| Australia NA only (leakage to Norfolk, New Cal) | |
| Australia NA only (leakage), 9-Net x 3 widescreen | |
| Arrow radio, tone FTA | |
| Pay-per-view movies; CA | |
| Pay-per-view movies; CA | |
| Pay-per-view movies; CA | |
| Secondary Aurora + Optus services | |
| Austar inter, Expo FTA | |
| NDS CA + Mrypt, CA | |
| CA, subscriptions available Australia, Norfolk | |
| Sky News active; "Help" FTA | |
| CA, subscriptions avail Au, Nrlfk; TVSN FTA | |
| CA, subscriptions available Australia, Norfolk | |
| "Home" CA, subscription available Australia, Nrlfk | |
| CA, subscriptions avail Australia, Nrlfk | |
| CA, subscription available Australia, Norfolk | |
| Central beam; also Central 7 at times | |
| * - plus 12.451H, 12.460H | |
| * - plus 12.293V, 12.402V, 12.411V | |
| Full schedule less commercials - links; may be CA | |
| PIDs vary; also try 12.360, 12.370 | |
| oec. digital feeds; typ fta | |
| Often NTSC; USA-Australia-NZ | |
| Also 12.437H same params; SBS HDTV + w-s | |
| FTA 4 channels (TVNZ x 4); +Maori here | |
| NDS CA, subscription available NZ | |
| NDS CA, subscription available NZ | |
| NDS CA, subscription available NZ | |
| also see 12.626, 643, 670, .688, & .706H | |
| NDS CA, subscriptions available NZ | |
| Radio SCPC "cover" for high speed data | |
| FTA, plans CA "soon" | |
| June 2002-Irdeto-2 CA | |
| Dataline west; also east PAS-2, 3901V | |
| PowVu CA | |
| Tests - CA service announced | |
| PowVu CA & FTA, subscription available | |
| was PAS-2, previously 3992Vt; feeds FTA | |
| NET25 + FTA; new PIDs April '03, reload | |
| PowVu CA; ch 11 DCP-CCP bootload; audio FTA | |
| PowVu/CA (some audio FTA) | |
| PowVu CA & FTA (EWIN + CBS +) | |
| NDS CA (6 channels); one test card oec FTA | |
| Myx FTA V1960, A1920 + radio FTA | |
| Mixed FTA & CA; STC gone (CA) | |
| PowVu FTA, replaces PAS-2 svc | |
| Difficult because of CCTV cross pole | |
| was As2; PowVu CA | |
| PowerVu; some audio FTA | |
| PowerVu, Asian MUX; new parameters Nov '03 | |
| # 8 MTV China FTA V289, A290 ; rest CA | |
| PowVu CA, WIN, ABC, NT, SBS; status unknown | |
| Test - may not stay permanently | |
| Temp FTA; will be CA, subs 011-800-2270-0722 | |
| May not be permanent; not available to NZ | |
| Occ FTA (Chile -); BIG power reduction Nov 03 | |
| Sporting feeds from USA (occasional) | |
| Irdeto 2 CA - subscriptions avail; Strong Tech | |
| PowVu (FTA) oec sport feeds inc. Japan BB | |
| BBC, test card FTA , others nominally CA | |

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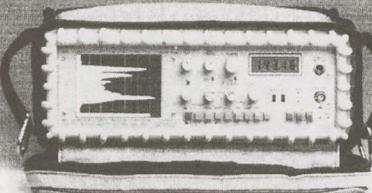
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| Bird | Service | RF/IF & Polarity | # Program Channels | FEC | Msym |
|-------------------|------------------------|------------------|--------------------|-----|-----------------|
| (PAS2/169E) | Adventists.tv | 4040/1010H | 1 | 2/3 | 5(.900) |
| | Feeds | 3868/1182H | 1 | 2/3 | 6(.620) |
| | Feeds | 3939/1211H | 2 (typ NTSC) | 2/3 | 6(.620)/7(.498) |
| | Cal PowVu | 3901/1249H | up to 8 | 3/4 | 30(.800) |
| | HK bouquet | 3850/1300H | up to 8 | 2/3 | 24(.900) |
| | Korean Bqt | 3771/1379H | 1 | 3/4 | 6(.510) |
| 1804/174E | iPSTAR | 12.619H | 1 | 2/3 | 25(.220) |
| | Tests-NZ beam | 12.646H | 1 | 3/4 | 22(.418) |
| | RFO Poly | 4027/1123R | 1TV | 3/4 | 4(.560) |
| 1701/180E | TNTV | 11.060&11.514V | 9 | 3/4 | 30(.000) |
| | Canal+ Sat | 11.610H | 16TV, 1 radio | 3/4 | 30(.000) |
| | PBS | 12.726(8)H | 16TV possible | 3/4 | 28(.066) |
| | TVNZ/BBC | 4186/964RHC | 1 | 3/4 | 5(.632) |
| | TVNZ | 4178/972RHC | 1 | 3/4 | 5(.632) |
| | AFRTS DTS | 4175/975L | 3 TV, 3 radio | 2/3 | 3(.680) |
| | TVNZ Aptn | 4170/980RHC | 1 | 3/4 | 5(.632) |
| | RFO-Canal+ | 4086/1064L | 4TV, radio | 5/6 | 12(.041) |
| | TVNZ feeds | 4052/1098RHC | 1 | 3/4 | 5(.632) |
| | TVNZ feeds | 4044/1106R | 1 | 3/4 | 5(.632) |
| | NZ Prime TV | 4024/1126L | 1 | 2/3 | 6(.876) |
| | NBC to 7 Oz | 3960/1190R | 1 | 7/8 | 6(.447) |
| | WorldNet | 3886/1264R | 1TV, 37 radio | 3/4 | 25(.000) |
| | Ioarana | 3772/1378L | 1 | 3/4 | 4(.566) |
| | NASA TV | 3854/1296R | 1 TV | 3/4 | 2(.000) |
| | TVNZ | 3846/1304R | 1 | 3/4 | 5(.632) |
| | NBA (Barker) Ch | 3803/1347R | 1 | 3/4 | 6(.111) |
| | 10 Australia | 3769/1381R | 4 | 7/8 | 20(.000) |
| | USA feeds | 3749/1401R | 4? | ? | 26(.400) |
| NSS-5/177W | Pacific IP Data | 3745/1405R | none-date | 3/4 | 44(.995) |
| | iPSTAR Tests | 12.691V | 8+ TV | 5/6 | 17(.600) |

| Receivers and Errata | |
|---|--|
| New December 2003, 24/7 "Hope Chs." | |
| FTA (occ sport); also try 3863, Sr6.100 | |
| FTA-typ NTSC-occ sport, live Shuttle | |
| PowVu CA + FTA (ABC-A-P 'til 'early' 2005) | |
| was 4148V; some FTA | |
| Korean MUX, reload 12-04; new Sr | |
| Tests, late May start, also 12.646H | |
| Testing possible data links; June 2003 | |
| SE spot beam, was 4027LHC | |
| east spot, 10TV + 1 each, vertical pol. | |
| 1+ FTA , MediaGd "2"; + 10.975 weaker | |
| Testing Fiji region pay-TV (MDS) package (Oct '04) | |
| DMV/NTL early vers., occ feeds, typ ca | |
| DMV/NTL early vers., occ feeds, typ ca | |
| 'DTS Direct to Sailors, audio previously FTA - gone | |
| DMV/NTL early vers., occ feeds, typically ca | |
| east hemi 20.5 dBw +, new Sr | |
| DMV/NTL early vers., occ feeds, typ ca | |
| SCPC, mixed CA and FTA feeds | |
| PowVu CA: Auckland net feeds | |
| CA, Leitch encoded | |
| New PIDs Dec 03 very strong NZ, Pacific | |
| FTA SCPC; East Hemi Beam-Tahiti | |
| 24/7 live space walks, conferences - West Hemi beam | |
| SCPC, mixed CA & FTA , feeds | |
| NBA feeds - probably CA - new Nov 2003 | |
| PowVu CA & TBN-JCTV FTA | |
| 16-QAM (not MPEG-2 compatible) | |
| Data only but useful for dish alignment, top Sr check | |
| Tests - Taiwan TV; data coming?? (NZ beam) | |

MPEG-2 DVB Receivers: (Data here believed accurate; we assume no responsibility for correctness!)

AV-COMM R3100 FTA, excellent sensitivity (review SF May 1998); new version Sept '99. AV-COMM P/L, 61-2-9939-4377.
 AV-COMM Tiny Tot. FTA, 12Vdc operated, palm sized, low power consumption, review SF#120. Contact # above.
 AV-COMM R3100(A). FTA, good sensitivity, ease of use exc (review SF May 2002). See above contact.
 Coship 3188C. Review SF#107. Blind search FTA rcvr; works well. Available from Satlink NZ www.satlinknz.co.nz (ONLY KNOWN DISTRIBUTOR IN WORLD)
 Divitone: "Left-handed" review SF#115; does "code key" entry. Available <http://www.satmax.ws>
 eMTech eM-100B (FTA), eM-200B (FTA + Clx2), eM210B (FTA + 2xCl + positioner), KanSat 61-7-5484 6246 (review SF#89)
 Fortec Star Lifetime Two versions, both blind search, code-key programmable, one X 2 Cl. Review SF#119. www.aDigitallife.com
 Humax ICR1 5400 (Z) Embedded Irdet+ 2 CAM slots; initial units had NTSC glitch, now fixed. Widely available; new software avail 04-04, SF#76.
 Humax ICR1 5410 (Z) Adaptable version capable of holding multi-CA systems (SF#98, 99). Widely available; original importer Sciteq (www.sciteq.com.au).
 Hyundai-TV/COM. HSS100B/G (Pacific), HSS-100C (China) FTA. Different software versions, 2.26/2.27 good performers, 3.11 and those with Nokia tuners also good; later 5.0 not good. SATECH (V2.26)
 Hyundai HSS700 FTA. PowerVu, SCPC/MCPC. Review SF March 1999. Kristal Electronics, 61-7-4788-8902.
 Hyundai HSS800CI. FTA, Irdet+ (with CAM) + other CA systems. PowerVu, NTSC. Kristal Electronics, above, review SF#63.
 INNOVIA IDS3088. Review SF#111. Blind search FTA receiver. High quality IRD, available Phoenix Technologies, and Satmax (<http://www.satmax.ws>).
 ID Digital CI-24 Sensor. New August 2003; new lower noise tuner, extra sensitivity; CI Interface slot Irdet 1 & 2; review SF#109. Sciteq 61-8-9409-6677.
 MediaStar D7. FTA, preloaded w/ known services, exc. software (review SF July 1998). MediaStar Comm. 61-2-9618-5777
 MediaStar D7.5. New (May 00) single chip FTA; review June 00 SF. MediaStar Comm. Int. 61-2-9618-5777
 MediaStar D10. FTA and Irdet embedded CA. VG receiver; see review SF#96, August 2002. Contacts immediately above.
 MultiChoice (UEC) 660. Essentially same as Australian 660, not grey market contrary to reports. Sciteq tel 61-8-9306-3738
 Nokia "d-box" (V1.7X). European, FTA, may only be German language, capable of Dr. Overflow software. SF#95, p. 14.
 Nokia 9200/9500. When equipped with proper software, does Aurora, originally did pay-TV services provided software has been "patched" with "Sandra" or similar program. See SF#95, p. 14, SF#96 p. 15. SatWorld 61-3-9773-9270 (www.satworld.com.au)
 Pace DGT400/DVR500. Originally Galaxy (Now Foxtel+ AustraL). Irdet, some FTA with difficulty (Foxtel Australia 1300-360818). UECs replaced; Sept 18 (2003) "drop-dead" day; all were to have been "turned off" on that date (in fact, those with V1.13 CAMs may still be working; still does radio including CA, not TV).
 Pace "Worldbox" (DST-620 in NZ). Non-DVB compliant NDS CA including Sky NZ, no FTA, similar "Zenith" version (see SF#115, p. 15).
 Phoenix 111, 222. PowVu capable, NTSC, graphics, ease of use. (111 review SF#57). SATECH (below): 222, terminated
 Phoenix 334 FTA SCPC, MCPC, analogue + dish mover. Detailed SF review SF#51. SATECH 61-3-9553-3399.
 Pioneer TS4. Mediaguard CA (no FTA), embedded Msym, FEC, only for Canal+Satellite (AntenneCal ++687-43.81.56)
 PowerVu (D9223, 9225, 9234). Non-DVB compliant MPEG-2 unless loaded with software through ESPN Boot Loader (see below). Primarily sold for proprietary CA (NHK, CMT etc). For service only - call Scientific Atlanta 61-2-9452-3388. For revision model D9850, see Scientific Atlanta (below).
 PowTek. Blind Search Chinese sourced, field tests rate it highly. Source jason@aDigitallife.com
 Prosat 2102S. FTA SCPC/MCPC, NTSC/PAL, SCART + RCA. Sciteq 61-8-9306-3738.
 SatCruiser DSR-101. FTA SCPC/MCPC, PowVu, NTSC/PAL. (Skyvision Australia 61-3-9888-7491, Telsat 64-6-356-2749); no longer available.
 SatCruiser DSR-201P. FTA SCPC/MCPC, PowVu, NTSC/PAL, analogue, positioner - (Skyvision - see above), no longer available.
 SATWORK ST3618. Blind search FTA receiver. Fast search, problems, especially in "memory-filing" system; review SF#111. Available DMSi at tim@dmsiusa.com.
 SATWORK ST3688. Blind search, 3000+ ch memory, multi-format RF modulator, improved version 3618. Review SF#113, available DMSi (above).
 Scientific Atlanta D9223, D9234, D9225; Orig. PowerVu, superceded Dec 2003 by D9850. Commercial receiver, available TVO 61-2-9281-4481, John Martin
 Strong Technologies SRT2620 SCPC, MCPC FTA, exc sensitivity, ease use, programming. Review SF#91 (ph. below)
 Strong SRT 4600 SCPC, MCPC, PowerVu, exc graphics, ease of use, review SF#64. Strong Technologies 61-3-8795-7990.
 Strong 4800 SCPC, MCPC, embedded Irdet+ CAM slots, does code-key with additional software. Aurora Strong Technologies 61-3-8795-7990.
 Strong 4800 II. SCPC, MCPC CAM slots x 2 for Aurora +, Zee, Canal +, code key with additional software. Strong Technologies (above), review SF#103.
 Strong 4890 SCPC, MCPC, 30Gb PVR, 2 CAM slots, DiSEqC 1.0, 1.2 (review SF#84), does code key with additional software, Strong Technologies, # above.
 UEC Atlas/Titan (1000). New July 2003. Replacing DGT400 for AustraL. No SCART, L-band loop, also available Rural Electronics 61-2-6361 3636.
 UEC642. Designed for Aurora (Irdeto), approved by Optus, w/new software, C-band FTA, faulty P/S. Norsat 61-8-9451-8300.
 UEC660. Upgraded UEC642, used by Sky Racing Aust., Foxtel, limited FTA. (Nationwide - 61-7-3252-2947); P/S problems.
 UEC700/720. Single chip Irdet built-in design for Foxtel, unfriendly for FTA. Power supply problems, seldom sold to consumers, propensity to fall off back of trucks.
 Winersat DigiBox 200 C + Ku basic receiver but includes Teletext for NZ TVOne, 2 VBI. Satlink NZ, fax 64-9-814-9447; long term teletext problems (loses TT).
 "X" Digital. When modified with "aftermarket" Internet software, does Aurora and other V-1 CA without card; review SF#119. Strong Technologies (61-3-8795-7990).
Accessories:
 Aurora smart cards. MYCRYPT (Irdeto V2) cards now available (Oct 2003). Sciteq 61-8-9409-6677.
 PowerVu Software Upgrade: PAS-8, 4020/1130Hz, Sr 26.470, 3/4, pgm ch 11 and follow instructions (do not leave early!).
 PowerVu (Pacific) repair service: Cable & Sat Svcs. Darius West. 61-2-9792-1421 (Email darius@cases.net.au)

WITH THE OBSERVERS

AT PRESS DEADLINE

Bill Richards (SA) reports Telstar 18/138E "I-Sky-Net" transponders 3420V and 3460V FTA (normally Sr 43.00, 3/4) FTA over weekend Dec 4-5. AssyriaSat Globecast scheduled to return before 15 December. UBI chs 1-16 went CA 5 December. DM NSW 1.8m reports LM1/75E 3800H using "Beam A" of satellite coverage, SR 20.000, 3/4 loads ABS-CBN MCPC.

AsiaSat 3S/105.5E: "Zee Cinema has left 3700V, replaced by announcement directed to 'cable operators' advising they contact Indian telco number." (HB) "Living Channel Asia is new FTA 3760H, Sr 26.000, 7/8, within NOW TV bouquet." (Gregory)

AsiaSat 4/120E: "New (apparent) RHC Ku signals on 11.727, 11.880 and 11.957; all Sr 24.450 with wide ranging sport, movie programming, beamed into Asia and China in particular." (BMing, Taiwan) (Editor's note: Off boresight checks are suggested along and south of equator.) "12.453V, Sr 20.000, 3/4 has added Viaccess CA service labelled 'Pacific TV 1'." (CSutton, NZ).

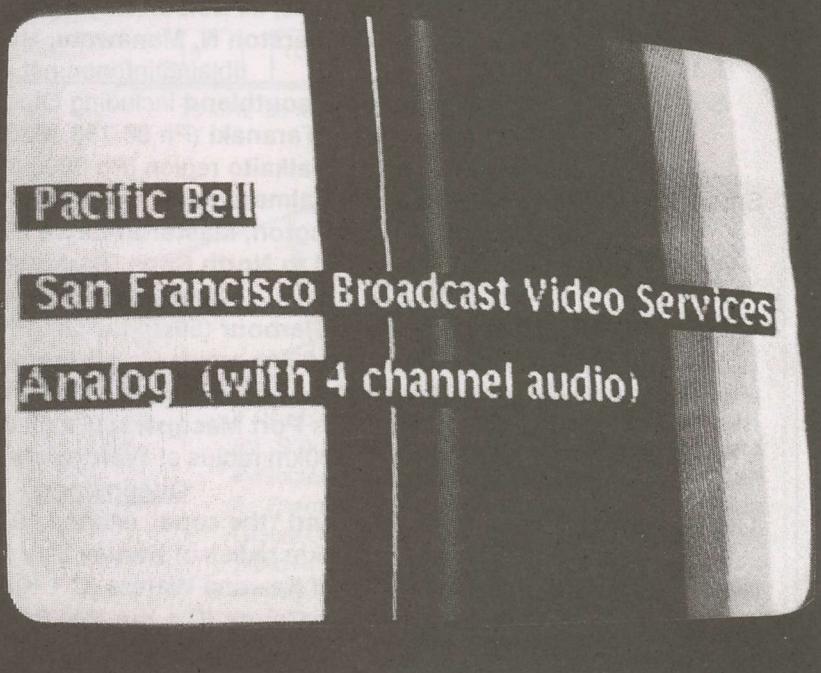
Intelsat 701/180E: (Editor's note: Fiji's turn on December 15th may not be on 4055 RHC - could be LHC. If that is the case, second transponder 1 January is likely to be 4135LHC. Logic however suggests RHC; p. 29 here.)

NSS-5/177W: "Many changes in CTS 12.691V (Sr 17.600, 5/6)." (CSutton, NZ) (Editor's note: This one is very strange; originally the Taiwan services here were explained as 'temporary' pending launch of Internet service into NZ using this transponder. But recent channel swapping suggests there may be more to this than future-Internet.)

NSS-6/95E: "Antenna Pacific (Greek) is now on 11.104H, Sr 2.800, 3/4 (was 11.083H)." (Conklin)

Optus B1/160E: "Seven Central and Tasmanian Digital have been bouncing back and forth on 12.354H; VPID 1280, APID 1281." (Ken) "Latest user of 12.353H is 'Tasmanian Digital TV', Sr 5.100, 3/4." (PS)

Optus B3/152E: "I'm a celebrity - get me out of here" was back from November 12 Globecast feed SCPC 12.553V, 6.110, 3/4. The channel label changed to 'TAC - Path 2' November 22 and the 'feedback' path appeared on Globecast ad-hoc channel. The Queensland feed's website was www.itv.com/celebrity." (AI, NSW) "Globecast has been running 12.445H, SR 6.666, 3/4 for its 'normal' feeds while 'Celebrity' has been on 12.553V. Coverage has included Moonee Valley Race Club (Victoria), labels as GCAST1." (IF, Qld). "Globecast's Syrian service originating from



Some of the more interesting "wild card" feeds pop up on I701, 3769RHC, Sr 20.000, 7/8; this was a "closed loop" broadcast to Macintosh distributors and dealers to explain latest products.

Modesto, California (SF#123) sources from terrestrial TV stations KBSV (as reported) and a second - KBES. They have been supering NZ (0800-000-885) and Australia (1800-000-885) for viewers to contact them." (NS, Vic) (Editor's note: As of 3 December, they were missing from Globecast mux suggesting their 'free trial' period has lapsed.) "The Hope Channel 'was added to Globecast T5/12.525V MCPC (VPID 2161, APID 2122) November 19." (Daniel) "Globecast needs to clean the lens of their roof-top camera which shows segments of Sydney - it has become increasingly 'dim' as dirt has built up over the past two months!" (IF, Qld.) "UBI converted Turkish channels - exception, TRTint) to CA November 20. On November 19th they began a promotional loop on several unused channels mentioning new language services 'coming shortly' - Spanish, Filipino, Greek, Portuguese and Polish. They added 3 Russian channels November 18, revised those channels November 26. On

WITH THE OBSERVERS: Reports of new programmers, changes in established programming sources are encouraged from readers throughout the Pacific and Asian regions. Information shared here is an important tool in our ever expanding satellite TV universe. Photos of yourself, your equipment or off-air photos taken from your TV screen are welcomed. TV screen photos: If PAL or SECAM, set camera to f3.5-f5 at 1/15th second with ASA 100 film; for NTSC, change shutter speed to 1/30th. Use no flash, set camera on tripod or hold steady.

Alternately submit any VHS speed, format reception directly to SatFACTS and we will photograph for you.

Deadline for January 15th issue: January 3 by mail or 5PM NZST January 5th if by fax to 64-9-406-1083 or

Email skyking@clear.net.nz.

These firms are available to do contract dish installs

Fiji Islands

C.B. Communications, **Sigatoka** (Ph6520227; cbcom@connect.com.fj)

Safeway Electronics Ltd, **Suva + Lautoka + all islands** (Ph 3395300/6666822; safeway@connect.com.fj)

SATSHEK Communications, **Suva** (Ph3307933; parmarbros@connect.com.fj)

New Zealand:

Tauranga TV Svcs Ltd, **western Bay of Plenty** (ethnic Ku packages) (Ph 07 578 7276; dave-tts@clear.net.nz)

Raycom, **Coromandel Peninsula/Waihi/Tairua** (B1 FTA) (Ph 07 864 8083; raycom@slingshot.co.nz)

Frontline Electronics, **Mosgiel** region (ethnic Ku packages) (Ph 03 489 4001)

Advanced Aerials, **Napier/Hawkes Bay**, comcls (Ph06835 6618/021 272 6618; advanceaerials@xtra.co.nz)

Nelson TV & Video Svcs, all **Nelson Bays** (Ph 03 548 0304; ntv@tasman.net)

Rexels AV Electronics Ltd, **Palmerston N, Manawatu, Hawke's Bay, Wanganui** (Ph 06 357 6186; rblair@infogen.net.nz)

John Stewart, **southland** including Otago (john.s@tritec.co.nz)

The Antenna Man, **Taranaki** (Ph 06 758 1633; antenna.man@xtra.co.nz)

Quality Pics, entire **Waikato** region (Ph 0800 007 667; maxnkay@xtra.co.nz)

Smartzone, **Wellington-Wairarapa-Palmerston N** (C+Ku) (Ph 029 289 6333; info@smartzonesystems.co.nz)

Homestead HiTech, **Wellington, Masteron-Levin** (PAS-2, B1, B3) fitzgera@ihug.co.nz)

Waipu Cable Television, **Wellsford to North Cape (Bluekiss)**, (Ph 09 4320 973; waipucable@xtra.co.nz)

New South Wales:

Woolgoola Antenna Service, **Coffs Harbour** (50km radius) (Ph 0266561889; woopaerials@iprimus.com.au)

Town & Country Antennas, 60km radius **Murwillumbra/Tweeds Heads** (Ph 02 6672 8595)

Newcastle Satellite, **Newcastle + Lwr Hunter Vly** (Ph 0249614449; satellites@netcentral.com.au)

Home Satellite TV, 40km radius **Port Macquarie** (Ph 02 6584 3838; kazbah25@optusnet.com.au)

Goodcom Communications P/L, 100km radius of **Walcha** (Ph 02 6777 1044; goodcom@northnet.com.au)

Queensland:

Cape York Electronics, **Cooktown and "the cape"** (started 1970s) (Ph 07 40 695 252; cyecltn@tpg.com.au)

Phil's Antenna Systems, 100km radius of **Hervey Bay** (C+Ku since 1996). (Ph 0741 256 273)

Rick Dalton TV & Satellite, 100km of **Kawana Waters** (C + Ku). (Ph 07 5493 4343; rick@antechtv.com.au)

Teleworks, 100km **Cairns** (C + Ku). (Ph 0412 84115; rajvrm@aol.com)

South Australia

Central Eyre Comms, **Arno Bay-Eyre Penins.** (Ph 08 8628 0203; centraleyrecomms@ozemail.com.au)

Tasmania:

.65 Electronics, **Launceston and Northern Tasmania** (Ph 03 63 330820; sales@65group.com)

Victoria:

Riviera Satellite Antenna Svcs, 100km radius **Bairnsdale** (Ph 03 5152 4884; gilhooleystv@net-tech.com.au)

Leden Communications, (100km radius) **Glengarry** (Ph 0427 745105; leden@netspace.net.au)

Geoff's Communications, 60km radius **Korumburra** (Ph 0408 582010; gwyhoon@tpg.com.au)

Foreign Satellite TVP/L, **Melbourne (region)** C+Ku since 1995 (Ph 040445509; joe12@dodo.com.au)

Solomon Islands

Satellite Solutions, **Honiara + all Solomon Islands** (since 1994) (Ph 677 25589, satsol@solomon.com.sb)

Thailand:

JSAT tv/Jon Clarke, **ex-pat community - nationwide** (Ph +661 513 5418; info@jsat.tv)

To be listed here, tell us: 1/ name of your business or your name, 2/ your home town and radius-distance covered from same, 3/ your telco, 4/ your e-mail. Send to skyking@clear.net.nz, or fax to ++64 9 406 1083 or mail to SatFACTS, PO Box 330, Mangonui, Far North, NZ. No, there is no charge to be listed but you must be a SatFACTS subscriber! (* - NEW or modified this month.)

November 27, 10.50PM, all four of the UBI MCPCs quit running; T14's two MUXes returned at 11:18PM, T15's at 11:48PM. They obviously have some 'wrinkles' to iron out, still!" (Benjamin, NSW) "Kurdsat is new, trial?, 12.658V VPID 1760, APID 1720." (Arnold) "Israel Plus and Inter + have appeared briefly on 12.640H." (IF, Qld) "Kurdistan has moved to 12.524V, replaced by new AMTV (Australian based) ethnic service - said to be 'similar to SBS'." (Plenty)

Optus C1/156E: "Reference data rates for Optus T1 upper (12.324V) - yes, rates were dynamic as low as 1.5 Mbit/s but subsequently Optus improved the rates on all four ABC channels and they have been running between 2.3 and 4.8 although there remains an unexplained problem with 'some'

receivers glitching." (IF, Qld.) "T1/upper 12.324V continued through November to run FTA (Sr 24.450, 1/2) while all channels on T3/12.407V and T6/12.527V were FTA from November 5 to 7. On November 16, a fault put all SBS TV channels off the air between 9:20PM and 9:45PM (SBS SE only) while at 10:10PM SBS Qld and SBS SA returned but airing the same programme as SBS SE (not normal)." (Daniel) "On November 9 Optus 'fixed' a problem with their 'Tune 156E' channel (currently carries 7 pages of information concerning changes in Aurora channel arrangements). The image had a built-in flicker before the correction; unfortunately when fixed they incorrectly set the VPID to 35 but someone noticed it should be 53 and got it correct the next day." (IF, Qld) "There is a 2 second time delay between

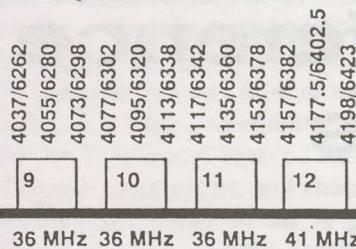
I701 Spot Beam possibilities - beyond

Fiji Sky Pacific

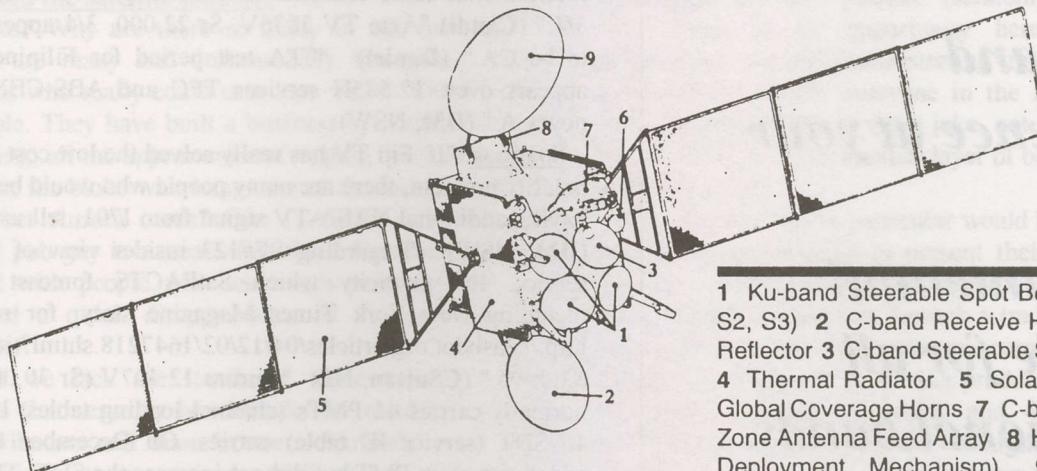
I701/180E has a wide range of capabilities. Fiji's initial transponder is likely to be Tr9/4055 (and right hand circular is presupposed). 701 design allows up to 4 transponders to be configured on "Spot Beam B" (4055, 4095, 4135, 4177.5 of which the first 3 are 36 MHz wide; the last 41 MHz). Fiji TV will ultimately occupy 2 of these (four) transponders leaving the opportunity for another service provider to "tag along" using one or both of the remaining transponders. Each of the four spot beam B capable can be individually switched from the normal "Global" (to spot) coverage configuration.

TVNZ, for example, could lease one of these transponders and distribute to the full Pacific New

Zealand programming. Sky NZ could do the same thing as an international extension of its present domestic service. Of note: TVNZ presently occupies 4052RHC, 4162 RHC, 4170 RHC, 4178 RHC, 4186 RHC and 4194 RHC. The majority of these - if indeed not all - are closing down at midnight January 1 as TVNZ terminates its wholly owned satellite connections division.



GLOBAL B
or SPOT B



INTELSAT VII Structural Layout.

1 Ku-band Steerable Spot Beam Antennas (S1, S2, S3) 2 C-band Receive Hemi/Zone Antenna Reflector 3 C-band Steerable Spot Beam Antenna 4 Thermal Radiator 5 Solar Array 6 C-band Global Coverage Horns 7 C-band Transmit Hemi/Zone Antenna Feed Array 8 Hinges (Single Pivot Deployment Mechanism) 9 C-band Transmit Hemi/Zone Antenna Reflector



DMS International

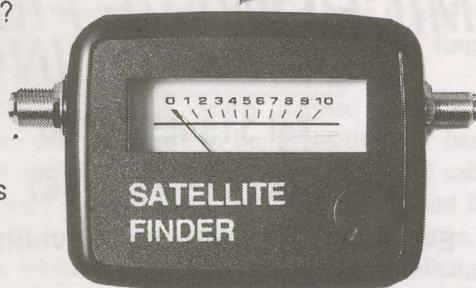
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ABC SE on T10/12.720V Sr 30.000, 3/4 and the new ABC SE (service ID 810) on T1Upper/12.324V Sr 24.450, 1/2 with T1Upper being behind. TV translators fed by T1Upper have a much greater propensity to glitch than those using T10 suggesting there remain problems with the T1Upper data stream that commercial receivers at translator sites cannot cope with." (NS, Victoria)

Palapa C2M/113E: "After some bouncing around, TVRI appears to be on 3765H, Sr 5.555, 3/4 VPID 33, APID36; FTA." (Arnold) (Editor's note: Like so many Palapa services this one in last month has bounced between FTA and CA.)

PanAmSat PAS2/169E: "YTN (Korea) 3771H has changed Sr to 6.510 (from 9.040), 3/4." (Kenny)

PanAmSat PAS8/166E: "More than 20 China Radio International audio channels now running 3959V, Sr 3.428, 3/4." (Candi) "Azio TV 3836V, Sr 22.000, 3/4 appears now to be CA." (Daniel) "FTA test period for Filipino MUX appears over; 12.575H services TFC and ABS-CBN News now CA." (DM, NSW)

Soapbox: "If Fiji TV has really solved the low cost circular polarity problem, there are many people who would benefit by having additional NASA-TV signal from I701; tell us more!" (DM, NSW) "Regarding SF#123 insider view of TV2Me service, the publicity which SatFACTS forecast is out including New York Times Magazine story; for reaction: <http://slashdot.org/articles/04/12/02/1647218.shtml?tid=129&tid=95>." (CSutton, NZ) "Aurora 12.407V (Sr 30.000, 2/3) normally carries 41 PMTs (channel loading tables) but only 40 SDT (service ID table) entries. On December 1 Optus added one more PMT but did not increase the SDT. The extra PMT, it is believed, prior to 1 December was for upgrading of UEC receivers; the new one added would therefore be for upgrading ADB receivers. This could foretell Optus plans to change their home transponder from T3/12.407V to another, as Foxtel/Austar did with their default/home settings last year." (IF, Qld.) "T5/12.487V (Sr 27.800, 3/4) by Foxtel carries the NDS encrypted Net 9 channels. Recently Optus added numerous extra PIDs to the original 3 Net 9 channels here - each now has two audio PIDs, two video PIDs, a teletext PID and several data PIDs. One of the data PID 'channels' runs at nearly 1 Mbit/s (suggesting they are moving a lot of data). Also, there is a new TV channel as well - labelled 'Ch9ph' which could spell pERTh." (AI, NSW) "With a spec an display, I am convinced B3's T12/12.501H is an active MCPC with a data rate in the region of 30.000. However the various Nokia and other 'solutions' refuse to load it suggesting strongly it is not MPEG-2. Anyone have another explanation?" (NS, Victoria)

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Thieves and the satellite industry

Thieves? Why are there so many in our industry? The examples are many and unfortunately transparent even to those of us who really could care less. Take TARBS/UBI as an example. They have built a business by taking the money and running; all the appearances of ripping consumers off. Or what about the bloke who hangs out at the local pub offering grey market Aurora cards? One (TARBS) is a large-scale scam; the pub guy is a small-time thief. Our industry is over populated with people who seem only motivated by a fast dollar and a quick disappearance to the next big scam opportunity.

What we lack are standards, some sort of technical guidelines that serve as benchmarks for installers, retailers, even distributors and manufacturers. Virtually every (other) industry works to recognised specifications and standards have the effect of weeding out those who refuse (or cannot) conform to at least minimal quality work. Examples are plentiful: NECA (National Electrical Contractors Association), MBAA (Master Builders Association). Lacking standards, or even a licensing scheme (which seems the least desirable of options), how does the end-use consumer know that any part of the system being purchased performs to any known and traceable "standard"?

How does a distributor know the IRDs he is purchasing in quantity perform to even the seldom-detailed manufacturer's data sheet? Can a dealer be certain that a LNB he pays a premium price to acquire is in fact even a fraction better than one that costs half as much? And the consumer customer - just what does a dish claiming "high wind area" survivability actually do that is better than a competitive product that lacks this claimed advantage?

Some products do include statements of performance. SatFACTS has pointed out in the last year several examples of coaxial cable which should *never* be used for satellite installations because of poor screening and high transmission losses. Yet I still see these inferior grade cables being sold as if nobody even bothers to read the performance statement of this product - only the price per metre costing line!

Regulations already in place require that electrical appliances (such as the IRD) conform to safety standards; the so-called "C-TICK" approval. It is illegal to sell electrical appliances in Australia and New Zealand which do not have a traceable safety standard approval. A recent visit to several dealer facilities revealed boxes of brand new IRDs without C-TICK. Do the folks selling these items realise that they can be arrested by the police and their stocks confiscated? Safety is a real issue and although it has nothing really to do with a

satellite product's actual performance, it is at least a bottom line to determine which products can and should be offered to the consuming public.

We badly need a trade association, a group that has the skills to create a set of standards which are willingly embraced by at least a majority of those who work in this industry. I hereby declare SITA - Scratchi's Installer Trade Association - open for business. The first order of business will be adopting a better name, of course!

I am appealing to every level of the industry to support the formation of a trade association. As a point of contact, I suggest you flood Bob Cooper's / SatFACTS email with your own thoughts, suggestions, and concerns (skyking@clear.net.nz) as well as directly to me at a special email account established for this purpose (scratchi_satfacts@yahoo.com.au). There is an opportunity here for a completely independent and self administrating trade association to fill a need which virtually everyone in the industry for the long haul recognises. This is not a joke, not an attempt at malice, not an effort to create another layer of bureaucracy in an over burdened world.

Pay-TV installers in particular would benefit from having a recognised organisation to present their demands for better training, improved working conditions, enhanced income opportunities. Consumers through a trade organisation would have a place to take their concerns, complaints and questions. Dealers would benefit by having product standards which are universally applied Australia and New Zealand wide. Distributors would have the strength of product buying numbers to ensure that manufacturers know *before* offering something for sale into our region of the world what specifications the equipment must meet, as a minimum.

Shifting gears, consider how as a totally disorganised group of people we have been dealt the short end of a very pointed stick with the current situation created by UNwired. Or consider how a growing number of community boards and councils are adopting discriminatory regulations which have the effect of prohibiting satellite dishes larger than 60 to 90cm. The recently deceased American comedian Rodney Dangerfield (Caddy Shack, etc.) made famous a five word sentence which pretty well sums up our status in the world today: "I don't get no respect."

Getting respect will take time - possibly years. It will require a statement of purpose (why we exist, at all), a volunteer board of governors to set out our principles and an army made up of distributors, dealers and yes consumers who have as their single goal the legal right to have C and Ku band satellite reception without the hassles and finger pointing we now endure.

A trade association with clearly defined goals is a spokesman for all that we aspire to be, protecting our basic rights to co-exist outside of the government sanctioned cable and pay-TV delivery schemes. It is an information point for consumers who desire to learn more about our activities, a body of expertise which can be brought to bear on challenges from regulators who are constantly being coerced by the likes of Foxtel to close down our free to air reception services. But perhaps most important of all, it is a central data bank of information which serves the purpose of giving all members access to technical assistance when required.

STIA? Call it what you will but *don't* call it "dead" before we give it a fair chance to breathe.

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Hard Core (seriously SERIOUS!) "How to do it" References

- UHF 20' Parabolic:** For a few hundred dollars in materials at the local lumber yard, you can build a 20+ dB gain UHF parabolic capable of providing "scatter region" reception to 300km! \$15 all regions.
ARCHIVAL LONG LOST AND NOW FOUND!
 - (■ **NEW RELEASE**) Tech Bulletin 9403 (t) - the legendary 40 page "VHF/UHF Receiving Antenna Design" report which has been said to be "the most perfect description of how VHF-UHF antennas work" ever created. This has never previously been offered - \$15 all regions.
 - (■ **NEW RELEASE**) Tech Bulletin 9401 - Actually follows in sequence TB 9305 Cable TV (below) - this issue (also long lost - not previously offered!) takes you through the hands on detail of actually planning a cable TV system - \$15 all regions.
- Tech Bulletin 9402: **MATV** (master antenna terrestrial) systems - wiring up a home, motel, hotel, camp grounds from one set of antennas - \$15 all regions.
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- TB9302: **(Terrestrial) Weak Signal Techniques**; off air reception to 300km+ using conventionally available equipment. Seriously detailed. \$15 all regions.
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 - TB9304: **Beating Noise** - identify source, fix noise interference to TV, radio reception. \$15 all regions.
 - TB9305: **Cable TV** - the basics. How a cable system works, how to build one! \$15 all regions.
- Nelson Parabolic Manual**. Step by step allows you to build satellite dishes with high accuracy to 13' - 4m diameter. Nelson was the very best and his techniques have stood the test of time. \$15 all regions.

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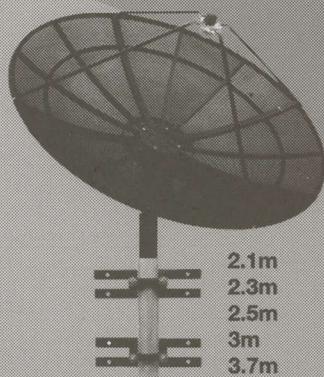


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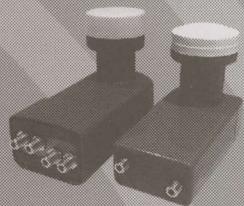


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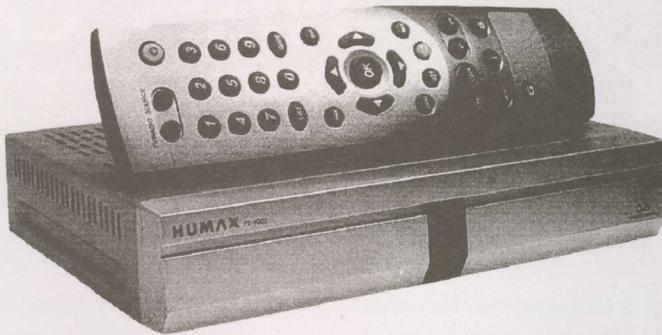
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